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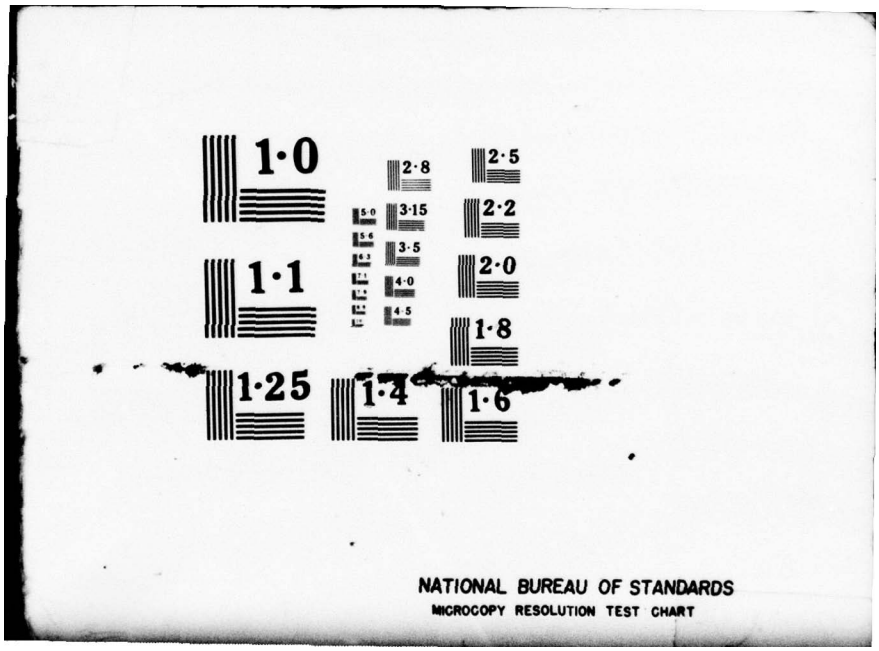
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Subj: Final Report of Phase I of "An Analysis of Navy Logistic Planning Factors" Study; promulgation of

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1. The study, "An Analysis of Navy Logistic Planning Factors", was undertaken to develop a rationale and methodology for updating or validating Navy logistic planning factors used in the Joint Operation Planning System (JOPS). The study is being conducted in two phases, as follows:

a. Phase I; for items used in peacetime, development of rationale and methodology for constructing logistic planning factors are based on peacetime issue data, and adjusted by combat intensity factors such as wartime vs. peacetime flying hours and steaming hours. For non-peacetime items (basically non-nuclear ordnance), the logistic planning factors will be derived from the Non-nuclear Ordnance Requirements (NNOR) system. (Nuclear ordnance is not included in this study.)

b. Phase II; acquisition of an automated data base; testing of the methods developed in Phase I; and production of prototype wartime planning factors.

2. The study has acquired a data base of 1 year's issue data (October 1974 to September 1975) for use in Phase II of the study. Analysis of the data and calculation of prototype factors are scheduled for completion by 30 September 1978.

3. Enclosure (1), describing the Phase I effort, now completed, is forwarded.

WILLIAM N. SMALL
Director
Navy Program Planning

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report describes Phase I of a two phase study. The study is an in-house effort by Navy personnel with contractor assistance.

Phase I of the study develops a rationale and methodology for the creation or validation of Navy Logistic Planning Factors used in the Joint Operation Planning System. Phase II will acquire a data base and test the proposed methodology by producing prototype logistic planning factors.

The Navy desires that Service planning be compatible with Joint Planning to the extent feasible. For this reason, the Navy resupply logistic

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planning factor data published in Table 1.5 of Logistics Reference Data, NAVMAT P-4000-2 were selected as prototypes for use in the Joint Operation Planning System and in the Logistics Annex of the Joint Strategic Capabilities Plan.

For peacetime based consumption of Navy materiel, methodology recommended in this report consists of a computerized analysis of Navy issue data collected from all sources, (GSA, DLA, Services) in the period 1 October 1974 to 30 September 1975. This data will be processed at the Navy Regional Data Automation Center, Washington, D.C. Peacetime consumption will then be adjusted to wartime rates by applying combat intensity factors and theater environment factors. The methodology for conventional ammunition, not normally consumed in peacetime, will be covered in the Phase II report.

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AN ANALYSIS OF NAVY LOGISTIC PLANNING FACTORS

PHASE I REPORT

15 March 1978

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EXECUTIVE SUMMARY

An Analysis of Navy Logistics Planning Factors Study

This report describes Phase I of a two phase study, "An Analysis of Navy Logistic Planning Factors". The study is an in-house effort by Navy personnel with contractor assistance, authorized by OP-04 study directive Ser 401/219311 of 7 April 1977. Membership of the study group is listed in Appendix L to the report.

Phase I of the study is intended to develop a rationale and methodology for the creation or validation of Navy Logistic Planning Factors (LPF) used in the Joint Operation Planning System (JOPS). Phase II will acquire a data base and test the proposed rationale and methodology by producing prototype LPFs. LPFs are used primarily by staffs of Unified Commands and Service Components (Fleet, Air Force, Army and Marine Corps Commands) to compute manpower billets and replacements, materiel support requirements; facilities and transportation requirements to support and move the combat forces designated in joint operation plans.

Joint Chiefs of Staff memorandum SM-774-76 of 16 September 1976 (Attachment 1 to Appendix C) requires that the Services provide certified logistic planning factors for use in joint operation planning. The Navy desires that internal Navy logistic planning be compatible with joint planning to the extent feasible. For this reason, the Navy

resupply LPF data published in Table 1.5 of Logistics Reference Data, NAVMAT P-4000-2 were selected as prototypes for use in JOPS and in the Logistic Annex (Annex B) of the Joint Strategic Capabilities Plan (JSCP).

For peacetime based Navy materiel the LPF developmental methodology recommended in this Phase I Report consists of a computerized analysis of Navy issue data collected from all sources, in the period 1 October 1974 to 30 September 1975. A key element of the methodology is the conversion of issue data from Federal Supply Class (FSC) in which the data is collected and managed, to DOD Supply Class, by which operation and logistic support planning is accomplished. This data, consisting largely of seventy reels of tape, provided by the Department of Defense Materiel Distribution Study, will be processed at the Navy Regional Data Automation Center (NARDAC), Washington, D.C. Other data will be provided directly from Navy sources. The peacetime data will then be adjusted to wartime rates, where necessary, by applying wartime vs peacetime operating tempos (e.g., wartime vs peacetime flying hours), also called combat intensity factors (CIF), and theater environment factors. A methodology for materiel not normally consumed in peacetime (e.g., conventional ammunition) will be covered in the Phase II report.

Phase I of the study was completed 30 November 1977. Phase II is scheduled to be completed 30 September 1978.

AN ANALYSIS OF

NAVY LOGISTIC PLANNING FACTORS

PHASE I

I. INTRODUCTION

A. Purpose

1. All Navy logistics planning systems are based on planning factors of one sort or another depending on the requirement for and level of the planning. Logistic Planning Factors (LPF) are developed and utilized to simplify the logistics planners' overall task and to reduce the time required to produce necessary plans. Simply defined, LPFs are actual or estimated relationships that may be used to predict a need in the future for some form of logistics action. Such a relationship might involve time, weight, volume, or other measurement units which are used in planning supply, resupply, and transportation. A resupply LPF is a measure of materiel consumption required to sustain a deployed unit. An example of such a resupply planning factor would be an expression of food consumption for a cruiser expressed in pounds of provisions per day per man. LPFs are essential to the success of the Navy's operation plans (OPLAN) in that they are required to:

a. Fulfill the Navy's responsibilities in the Joint Operations Planning System (JOPS) (see Appendix C)

b. Support the Joint Strategic Capabilities Plan

2. Currently, the resupply LPFs utilized by Navy planners are contained within Table 1.5 of Logistics Reference Data, NAVMAT P4000-2. This table contains data that has not been reviewed in depth for several years and has not been adapted to fulfill the requirements of the CINC planner for input into the JOPS. Consequently the usefulness of these planning factors in their current form is limited and their validity in doubt.

3. As set forth in SM-774-76 (Attachment 1 to Appendix C), the Navy is responsible for "developing, defining, and validating the logistic planning factors which they require to be used for joint operations planning."

4. The Navy Inspector General Report of the 17 September 1976 Command Inspection of CINCPACFLT Headquarters[1/] recommended that a review of JOPS oriented resupply planning factors be undertaken to ensure that valid non-unit related movement requirements are being generated in support of CINCPACFLT OPLANs. Generation of such movement requirements is directly dependent on the validity of the LPFs used by the planners.

5. The Deputy Chief of Naval Operations (Logistics) issued a study directive on 7 April 1977, (Appendix A) to initiate an analysis of Navy LPFs to be conducted as a CNO

1/ Navy Inspector General Report, Command Inspection of CINCPACFLT Headquarters, Subject: "Credibility of OPLAN Resupply Planning", 414-76 (Confidential), 7-17 September 1976

in-house study with contractor technical support. The objective of the study is to: "Identify and record existing rationale and methodology and, as appropriate, develop new rationale and methodologies by which logistics plans, requirements, and budgets using these factors will be more credible and supportable to higher authority." This report is the result of the initial phase of this study. It identifies and proposes a methodology, whereby resupply LPFs may be established and promulgated for use by the CINC logistics planners as basic inputs for OPLANS in the JOPS process.

B. Method of Analysis

In order to conduct the study, the Study Group performed the following:

- Literature Search - A search of literature and authoritative references was conducted concerning the JOPS, current planning factors, and developmental methodology.
- Interviews - Discussions were held with cognizant personnel at Navy, Army, Air Force and Joint Agencies to research the development and use of planning factors.
- Investigation and Data Gathering - An analysis was performed of systems utilizing LPFs to determine their use in operational and mobilization planning. Data and documentation, as available, were collected and catalogued for future application.

- Modeling - Modeling techniques were developed for computing and validating JOPS oriented resupply LPFs.

- Testing - In Phase II of this study, various simulation and testing techniques will be applied to verify the proposed methodology prior to its being promulgated for use by the Navy.

C. Exclusions

Nuclear weapons and propulsion related planning factors are excluded from the scope of this study.

II. DISCUSSION

A. General

1. As required by the Study Directive, the Study Group reviewed Navy LPFs with emphasis on those factors required for valid inputs to the Planning Factors File of the JOPS Movement Requirements Generator (MRG) (see Appendix C) and for inclusion in the Logistic Annex of the FY 78 JSCP.

Literature review and interviews by the Study Group indicated that the Navy uses LPFs in the following processes:

a. Joint Operation Planning System (JOPS). The JOPS is a standard, DOD-wide automated system for the development, coordination, dissemination, review, and approval of OPLANS. (See Appendix C). LPFs are required as inputs to this system to arrive at a final evaluation of OPLAN transportation requirements and feasibility.

b. Joint Strategic Capabilities Plan (JSCP). Annex B (Logistics) of the JSCP requires Service input of planning factors consistent with those required for input to JOPS to ensure standardized application by all commands and to facilitate annual Service review and update. Valid LPFs are required to provide credibility to the annual movement analysis required by JSCP.

c. Joint Strategic Objectives Plan (JSOP). The JSOP develops strategy, force planning guidance, and force requirements in consideration of threat, national

objectives, and policy. LPFs are used to develop the logistics requirements for support of the strategy.

d. War Reserve Materiel Stock (WRMS). In the event of hostilities, the WRMS is intended to ensure that combat forces have adequate supplies on hand to carry them until resupply.

2. Generally the factors being emphasized in this study are the resupply factors for JOPS and JSCP. These resupply LPFs are published in Table 1.5 of Logistics Reference Data, NAVMAT P4000-2. Although background information in this publication indicates that Table 1.5 was based on consumption data developed from operating forces during different degrees of intensity in the Southeast Asia combat environment, the Study Group found that details relating to the specific methodologies used to collect and report data and to develop and/or review the resupply planning factors were not available. Therefore, the credibility of the current planning factors and the reliability of the methods used in their development could not be validated. Thus, by consensus of the Study Group and as recommended to and approved by the Chairman of the Advisory Committee, it was decided that further research on reconstruction of the rationale and methodology used in the development of the existing resupply planning factors would not be fruitful. The remaining effort during Phase I concentrated on developing JOPS related planning factor

tables for all resupply LPFs with the exception of Ammunition (Class V), and the development of a new methodology. A JOPS related methodology for Ammunition (Class V) will be based upon expected wartime consumption as developed by the Non-Nuclear Ordnance Requirements process.

3. Discussions with key personnel (summarized in Appendix F) and an analysis of the systems that use the resupply LPFs clearly identified that: (1) the CINC logistics planner is the principal user of the resupply LPFs to develop and test the feasibility of OPLANS; (2) resupply LPFs must be in JOPS format; e.g., pounds/man/day or gallons/unit/day by JOPS class/subclass of supply by Unit Type Code (UTC).

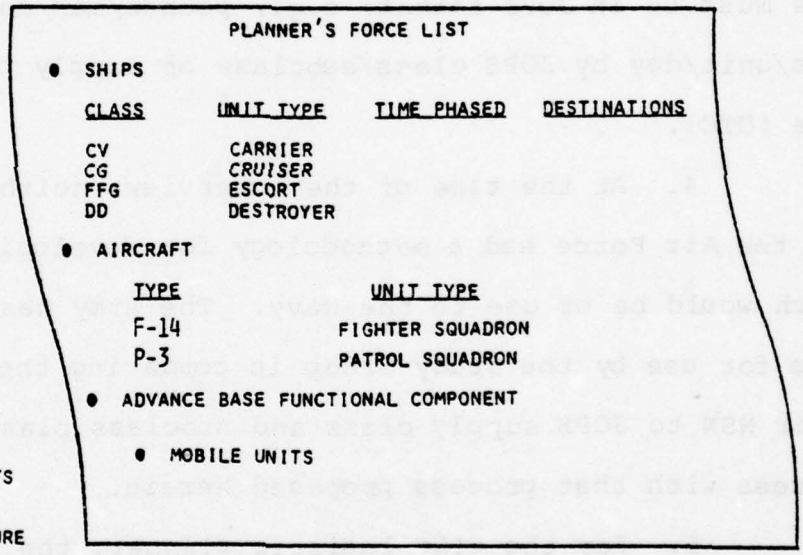
4. At the time of the interview, neither the Army nor the Air Force had a methodology for developing LPFs which would be of use to the Navy. The Army has provided data for use by the Study Group in comparing the results of their NSN to JOPS supply class and subclass classification process with that process proposed herein.

5. For the CINC logistic planner, the JOPS planning cycle begins with the receipt of a force list from which the planner develops the sustaining resupply movement requirements for the forces that are called for in the OPLAN. This force list specifies required units (ships, aircraft squadrons, mobile units, and Advanced Base Functional Components (ABFC)) which are time

phased and identified by destination in the objective theater. These units are expressed in terms of UTCs which are notional planning units. Then, using LPFs the MRG module of the JOPS develops resupply movement requirements by JOPS class/subclass of supply (see Appendix C). Table II-1 provides a conceptual illustration of the Fleet Logistic Planners force list.

Table II-1

FLEET LOGISTIC PLANNER'S FORCE LIST



TASK:

DEVELOP RESUPPLY MOVEMENT REQUIREMENTS BY USE OF LPFS IN JOPS RELATED STRUCTURE

B. Identification of a Methodology

1. General. The foundation of valid planning factors is good usage data. Therefore, the Study Group undertook to first define a methodology of collection and

analysis of historical supply consumption by individual unit as identified by Unit Identification Code (UIC) which could be aggregated into JOPS class/subclass of supply. Similarly, personnel data for each UIC was identified as the second basic element of factor calculation.

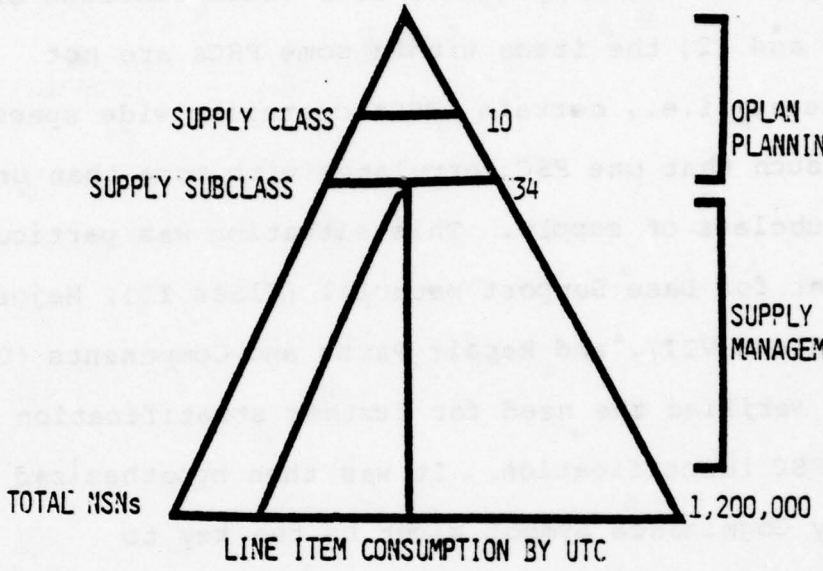
2. Consumption Classification (less Ammunition, Class V). Although Fleet logistics planners must develop the Planning Factors file (PFF) of the JOPS MRG with inputs in pounds/man/day, gallons/man/day, pounds/ unit/day or gallons/unit/day identified to the JOPS planning class/subclass of supply, it became readily apparent that no usage data collection system within the Navy identified consumption for most items in this structure. The exceptions to this situation are Subsistence (Class I) and Personal Demand Items (Class VI) which are tracked by the Navy Supply Systems Command (NAVSUP) and Bulk POL (Class III) which is tracked by NARDAC. With the above exceptions the Navy inventory is managed and reported by National Stock Number (NSN) in combination with a technical Cognizance Symbol. The NSN is formed by combining the four digit Federal Supply Class (FSC), a relatively homogeneous area of commodities in respect to their physical or performance characteristics, with the nine digit National Item Identification Number (NIIN). This union forms the

thirteen digit NSN. In the Navy each NSN is prefixed by the two digit Cognizance Symbol, which identifies technical and financial management responsibility within the Navy. Therefore, in order to compute resupply LPFs for other than Subsistence (Class I), Bulk POL (Class III), Ammunition (Class V), and Personal Demand Items (Class VI), a method had to be established which would both classify Navy NSNs into JOPS class/subclasses of supply and also identify NSN consumption to a UTC by class of supply by time period. Conceptually, the aggregation problem is illustrated in Table II-2.

To develop a successful solution to this aggregation problem, the Study Group undertook a search for elements of commonality within the Navy supply management system that might relate a given NSN to a JOPS planning class. Since a manual identification to JOPS subclass of each of the 1,200,000 Navy interest NSN items, similar to the process apparently performed by the Army, would require significant resources and time, a methodology reliant on modern computerized resources was sought. Analysis of the structure of the FSC, the first four digits of the NSN, indicated that all materiel is assigned to one of seventy-seven groups which are further subdivided into 605 classes. Each class covers a relatively homogeneous area of commodities which are classified with respect to: either (1) physical or performance characterisitics; or (2) the items included

Table II-2

CONCEPTUAL AGGREGATION PROBLEM



NOTE: The base of the triangle represents line item consumption, by UTC, of the total number of NSNs of Navy interest, approximately 1,200,000 items.

The inner triangle symbolizes the "roll up" of line items by UTC to one of the thirty-four JOPS subclasses of supply

therein are such as are usually requisitioned or issued together; or (3) the items constitute a related grouping for supply management purposes.

Based on this analysis a two dimensional matrix was formed that classified FSCs into JOPS class/subclass of supply. The classification procedure was based on the relationship of items defined as being within an FSC correlated with the definitions given for each of the JOPS

class/subclasses of supply. Analysis of this matrix resulted in the following conclusions: (1) many FSCs can be categorized directly into a JOPS class/subclass of supply; and (2) the items within some FSCs are not homogeneous; i.e., certain FSCs contain a wide spectrum of items, such that one FSC correlates with more than one JOPS class/subclass of supply. This situation was particularly prevalent for Base Support Materiel (Class II), Major End Items (Class VII), and Repair Parts and Components (Class IX) and verified the need for further stratification beyond simple FSC identification. It was then hypothesized that the Navy Cognizance Symbol might be the key to classification of those FSCs which apply to more than one JOPS class/subclass of supply.

In order to test this hypothesis, the Study Group analyzed FSCs which appeared to be problems. An example is FSC 5820, Radio and Television Communications Equipment, except airborne. With the aid of a printout provided by the Navy Ships Parts Control Center (SPCC), a breakdown of all the Cognizance Symbols contained in FSC 5820 was obtained along with the number of items managed within each Cognizance Symbol.

Within FSC 5820 there are thirteen distinct Cognizance Symbols and 6658 NSN items managed by SPCC. Based on this information categorization of FSC 5820 directly into one class/subclass of supply is not feasible primarily because

major end items, JOPS Class VII, and repair parts and components, JOPS Class IX, are combined together within the same FSC.

Next a review of the eighty-nine Navy Cognizance Symbols was conducted by the Study Group to determine to what extent, if any, Cognizance Symbols could be used to categorize NSNs directly to JOPS class/subclass of supply. The results of this review, summarized in a matrix chart in Appendix G, indicate all but fifteen Cognizance Symbols can be identified directly to JOPS class/subclass of supply. This finding was generally corroborated by the Logistics Reference Data, NAVMAT P4000-2 as reported in Appendix E. Further, analysis of these fifteen Cognizance Symbols indicated that if they were to be used in combination with the FSC, JOPS classification apparently could be made. The method of identification of NSNs to a JOPS class/subclass includes two cases. Case one is a direct correlation from NSN to the JOPS class/subclass using the Navy Cognizance Symbol for those sixty-two Cognizance Symbols which appear to relate directly. Case two, for the NSNs in the fifteen Cognizance Symbols which apparently do not directly relate to JOPS class/subclass, requires the additional step of sorting by FSC to identify the JOPS class/subclass. An example of this classification is presented in Table II-3.

3. Consumption Data Bases. Having developed the aggregation methodology, a search was conducted and

Table II-3

FSC ANALYSIS

FSC 5820	COG	NO. OF #ITEMS	JOPS SUBCLASS
SHIPBOARD REPAIR PARTS	1H	3464	IXG
MAJOR SHIPBOARD ELEC. EQUIP.	2F	52	VIIG
SHIPBOARD ELEC. REPAIR PARTS AND COMPONENTS	2H	85	IXG
MAJOR SHIPBOARD MECH. EQUIP.	2S	4	VIIG
SURF MISSILE REPAIR PARTS	2U	16	IXL
SHORE (GROUND) ELEC. EQUIP.	2Z	707	VIIG
AIR ORDNANCE & ELEC. EQUIP. & ORDNANCE REPAIR PARTS	4A	113	IXA
ELEC. PARTS & COMPONENTS	4G	2091	IXG
ELEC. PARTS & COMPONENTS	4N	110	IXG
FSM PARTS & COMPONENTS	6A	3	IXM
AIR MISSILE REPAIR PARTS	6E	7	IXL
GP ELEC. TEST EQUIPMENT	6G	3	IIB
FBM PARTS & COMPONENTS	6H	3	IXG
TOTAL	13	6658	6

appropriate data bases were identified which contain consumption data comprehensive enough to assure the computation of valid consumption rates. These data bases are as follows:

a. Subsistence. The Navy Food Service Systems Office (NFSSO), Washington, D.C., maintains current and comprehensive data incorporating consumption since 1968 by UIC. This data will be utilized to compute the Subsistence (Class I) LPFs.

b. Bulk POL. NARDAC maintains bulk POL consumption data by UIC which will be utilized to compute Bulk POL (Class III) LPFs.

c. Personal Demand Items. The Navy Resale System Office (NRSO), Brooklyn, New York maintains data on consumption of Personal Demand Items (Class VI) which will be utilized to compute LPFs.

d. Medical Materiel. The Naval Medical Material Support Command (NAVMEDMATSUPPCOM), Philadelphia, Pennsylvania maintains current and comprehensive data on consumption of medical materiel. This data can be related to UTC and will be utilized to compute medical materiel (Class VIII) LPFs.

e. Other Items less Ammunition (Class V). Although the data base maintained by the Navy Inventory Control Points (ICPs) under the Uniform Inventory Control Point Program (UICP) includes equipment related consumption through the Weapons System File and personnel oriented

consumption through the Master Data File, consumption of Defense Logistics Agency (DLA) managed items is not included. Additionally, the cost of collecting and processing this partial information would have been significant. Therefore the data base developed, collected, and maintained by the Department of Defense Materiel Distribution Study Group (DODMDS) was reviewed to determine its applicability to the requirements of LPF calculation. Analyses and discussions held with DODMDS representatives identified a file that appears to satisfy the requirements. This file, Mini Ship I, forms the basis for the DODMDS NSN aggregation. The specific data elements in this file and general DODMDS data base information are presented in Appendix H. While the objectives of the DODMDS and Navy LPF studies are not parallel, the original source data, as reflected in Mini Ship I, reflects wholesale-level issue transactions for a twelve month period[1/] by FSC/NIIN identified to UIC. The data also reflects item catalog data such as dimensions, weight, and cube which are required. However, this data base does not include the Navy Cognizance Symbol required by the aggregation methodology. ADP tapes which list Cognizance Symbol by NSN were determined to be available within

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1/ This file was selected by the Navy Logistics Planning Factors Advisory Committee as the preferred source from which to construct a data base. Whether the twelve month period represents a complete requisitioning picture or is comprehensive cannot be determined at this time. To assure currency of the LPFs in the future an updating procedure will have to be developed to maintain data base currency.

the Navy and easily compiled with the DODMDS data for aggregation. Since the DODMDS data base includes the necessary catalog data, it will be used where appropriate to provide both consumption and commodity characteristics data to develop LPFs for those JOPS class/subclasses of supply requiring resupply planning factors. (See Appendix D)

4. Personnel Data. Personnel data contained in the Type Unit Data File maintained at NARDAC will be used for LPF calculations.

5. Computational Method. The computational method for the development of resupply LPFs for all JOPS classes of supply except Ammunition (Class V) logically follows from the aggregation methodology stated above; i.e., the resupply LPF, in its numerical form, is presented by JOPS class/subclass of supply by UTC. Mathematically, the general computational methodology for determination of pounds/man/-day is reflected in Table II-4.

Application of a Combat Intensity Factor (CIF) assumes that peacetime consumption data will be derived from the data base. CIFs have been developed by the Navy and approved by OSD for the Navy's secondary item requirements and budget development. These factors are based on the ratio between combat steaming days and peacetime steaming days for ships and on the ratio between peacetime flying hours and combat flying hours for aircraft model/configurations. Analysis and development of CIFs will

Table II-4

GENERAL LPF COMPUTATION

(1) $C_{W_{NSN}} = (C_p \times CIF \times W)$

(2) $C_{W_{UTC}} = \sum_{i=1}^{n} C_{W_{NSN}}$ (By Subclass of Supply)

(3) $LPF = \frac{C_{W_{UTC}} \text{ (By Subclass of Supply)}}{360\ (M_p)}$

where:

C_p = Peacetime consumption for one year in units of issue of each NSN for all UICs notionalized to UTC

CIF = Combat Intensity Factor

n = All NSN items identified to a subclass of supply

W = Weight of the NSN unit of issue

M_p = Number of personnel assigned to the UTC

$C_{W_{NSN}}$ = Weight of the NSN unit consumed in wartime

$C_{W_{UTC}}$ = Weight of the NSN units consumed by UTC/subclass

LPF = Logistics Planning Factor

be accomplished in Phase II as necessary.

6. Ammunition. Peacetime consumption data are not used or applicable to ammunition requirements. Ammunition requirements are based upon DOD budget and procurement guidance, and technical ordnance engineering requirements. The NNOR process estimates ammunition combat

develop a methodology for adapting the NNOR process to the JOPS. The methodology for determining the Class V LPFs will be developed in Phase II of this study.

7. Non-Military Materiel. OPLANS do not require Navy resupply of materiel to support such non-military programs as agricultural and economic development (Class X).

III. FINDINGS

Based on the analysis conducted during Phase I of the study of Navy LPFs, the Study Group has found that:

- JOPS is a JCS sponsored system, and it is incumbent upon the Navy to be responsive to it and develop procedures to meet its requirements as well as to fulfill the Navy's own resupply and transportation needs.

- Authoritative Navy LPFs must be available and maintained.

- The Fleet CINCs require valid resupply LPFs for developing the Planning Factors File of the JOPS MRG. CINCs currently use Table 1.5 of Logistics Reference Data, NAVMAT P4000-2 as the major data source.

- There is insufficient detail in the narrative describing the resupply LPFs contained in Table 1.5 of Logistics Reference Data, NAVMAT P4000-2 to permit reconstruction or validation of the LPFs.

- NAVMEDMATSUPPCOM, NRSO, and NFSSO do calculate and maintain valid planning factors for Medical Materiel (Class VIII), Personal Demand Items (Class VI), and Subsistence (Class I).

- At the time of the interviews neither the Army nor the USAF had developed a methodology which could be adaptable to Navy use.

- Since requirements are not based on peacetime demand, a separate methodology will be required to interface

ammunition requirements, as determined in the Non-Nuclear Ordnance Requirements (NNOR) process, with the JOPS.

- Materiel to support non-military programs (Class X) is not pertinent to this study.

- The pertinent table within Logistics Reference Data, NAVMAT P4000-2, to which the new methodology will apply, is Table 1.5, Consumption Data for Supply Categories of Materiel.

- Table 1.5 of Logistics Reference Data, NAVMAT P4000-2 and the resupply LPFs therein need to be revised and reformatted for JOPS MRG input according to the requirements of Fleet logistics planners.

- JOPS requires the reporting of resupply consumption on the basis of pounds/man/day, gallons/man/day, pounds/unit/day, or gallons/unit/day.

- The methodology as developed by the Study Group appears to provide a viable method to classify Navy interest items into JOPS class/subclass of supply used in OPLAN analyses.

- CIFs and theater adjustment multipliers (LANT, PAC, etc.) need to be considered further.

IV. RECOMMENDATIONS

The Study Group recommends that:

- The NFSSO data base be used to compute Subsistence (Class I) consumption factors. (Continuing action).
- The NARDAC POL data base be used to compute Bulk POL (Class III) consumption factors. (Continuing Group Action).
- The NRSO data be used to compute consumption factors for Personal Demand Items (Class VI). (Continuing action).
- The NAVMEDMATSUPPCOM data base be used to compute consumption factors for medical materiel (Class VIII). (Continuing Action).
- The DODMDS data base, as identified herein, be used to compute Navy consumption factors for Base Support Materiel (Class II), Packaged Petroleum Products (Class III), Construction Materiel (Class IV), Major End Items (Class VII), and Repair Parts and Components (Class IX). (Study Group Action).
- Methodology be developed which will interface Ammunition (Class V) requirements, as determined in the NNOR process, with JOPS. (Study Group Action).
- Materiel to support non-military programs (Class X) not be addressed in this study.
- Rules and procedures be developed and documented that provide for the maintenance of the resupply LPFs. (Study Group Action).

- Analysis and development, as necessary, of CIFs is required. (Study Group Action).

- An appropriate format be developed to disseminate new official Navy LPFs. (Study Group Action).

APPENDIX A

STUDY DIRECTIVE

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, D.C. 20350

IN REPLY REFER TO
Ser 401/219311

AUG 7 1977

From: Chief of Naval Operations
To: Distribution List

Subj: Study Directive for an Analysis of Navy Logistic Planning Factors

Ref: (a) Joint Operation Planning System (JOPS), Vols I and III
(b) Navy Inspector General Report of Inspection of CINCPACFLT 7-17 Sep 1976, Recommendation 414/76

Encl: (1) Guidance for CNO Studies and Analyses
(2) Manning Requirements for the Analysis of Navy Logistic Planning Factors

1. Title. Analysis of Navy Logistic Planning Factors

2. Type. CNO in-house study with contractor support.

3. Background. This study is being conducted at the request of the Deputy Chief of Naval Operations for Logistics under the CNO Study Program. Logistic planning factors are essential tools to the Navy's operation planning and logistic support (resupply) functions. Logistic planning factors are necessary for:

- o Fulfilling the Navy's logistic planning responsi bilities under the Joint Operation Planning System (JOPS). The JOPS is a major planning system established by the JCS and is a standard application program of the World Wide Military Command and Control System (WWMCCS). Reference (a) describes the system.
- o Supporting the Joint Strategic Capabilities Plan (JSCP).
- o Determining War Reserve Material Requirements (WRMR).
- o Supporting the personnel replacement, material re-supply, and industrial mobilization base required for OPLANS.

Subj: Study Directive for an Analysis of Navy Logistic Planning Factors

a. Logistic Planning Factors are used by Fleet CINCs, OPNAV, NAVMAT and the Systems Commands in logistics support planning and industrial mobilization planning. Existing logistic planning factor tables have not been reviewed in depth for several years. They have, therefore, lost their credibility. As a result, budget requests for WRMR have been reduced or rejected. Reference (b) recommends corrective action to improve credibility of OPLANS and related WRMR. This will be addressed during this study.

b. The rationale and methodology used in the original development of many of the logistic planning factors were never recorded, date back to the early period of the Vietnam war or earlier, and have not been validated for several years. New weapons systems, changing modes of transportation, and the increasingly tight controls over military spending and control of same, need to be fully taken into consideration in the rationale used in validating or developing logistic planning factors.

4. Objective. The study will identify and record existing rationale and methodology, and as appropriate, develop new rationale and methodologies by which logistic planning factors are structured, so that logistic plans, requirements and budgets using these factors will be more credible and supportable to higher authority. The results of this study will be incorporated into the Logistic Annex of the Joint Strategic Capabilities Plan (JSCP); the Logistics Factors File (LFF) of the Joint Operation Planning System (JOPS); and the Navy publication NAVMAT P-4000-2, Navy Logistics Reference Data.

5. Specific Guidance

a. The study should conduct a critical examination of all Navy logistic planning factors. Validity, credibility, and supporting rationale and methodology are the prime considerations in this examination. Emphasis should be placed on those factors required for the Logistic Factors File (LFF) of the Movement Requirements Generator Sub-System of the JOPS. This is needed so that the Joint Chiefs of Staff (JCS) will have validated logistic planning factors for inclusion in the Logistic Annex of the FY 1978 JSCP.

b. The study should include a detailed look at the existing rationale and methodology behind each planning factor,

if any, and make a determination as to its reliability and applicability to present day needs. The other services should be visited to determine if their rationale and methodology would apply to Navy use. The study will develop new or revised rationale and methodologies in order to provide validated planning factors in the future.

c. Each system (manual or automated) which makes use of logistic planning factors should be identified and its involvement, scope, theater of operations, validity, overlap with other systems, and its operational condition should be defined. The usefulness of each system should be determined and recommendations prepared for future changes and/or development necessary to provide a total, responsive system to support the Navy's requirements.

d. The study should ensure that the preparation, use, and reporting of logistic planning factors by field activities have been thoroughly investigated and responsible Command personnel interviewed. This should supply the necessary information for validating existing logistic planning factors including changes and deletions and making recommendations for the development of new planning factors.

6. Coordination and Review.

a. The Study Sponsor is OP-04.

b. The CNO Project Officer is Mr. B. Gruber, OP-401G, 695-5109.

c. An Advisory Committee, chaired by the Deputy Chief of Naval Operations (Logistics) OP-04, is established. Members will include representatives of OP-01, OP-06, OP-90, OP-96, and Chief of Naval Material. The Commandant, Marine Corps, is invited to participate. Other OPNAV Deputy Chiefs, the Chief of Naval Personnel, Chief, Bureau of Medicine and Surgery, Commander Naval Sea Systems Command, Commander, Naval Supply Systems Command, Commander, Naval Air Systems Command, and Commander, Naval Electronics Systems Command will be requested to designate representatives to attend Advisory Committee meetings upon invitation of the Chairman, or the Chief of Naval Material as appropriate. It is requested that each organization represented on the Advisory Committee designate a point of contact to the Project Officer within

ten days from the date of this directive, and the Chief of Naval Material will designate points of contact from the Systems Commands. The President, CNA, is invited to attend Advisory Committee meetings.

d. A study group consisting of members of appropriate OPNAV, NAVMAT, Marine Corps, and BUMED Staffs chaired by the Project Officer, will participate in the conduct of this study on a part-time basis. Study Group membership is designated in enclosure (2).

e. The Director, Systems Analysis Division (OP-96), shall conduct a technical review to monitor progress and ensure quality of the study. During the course of the study, this effort shall include review of working papers and reports for validity and completeness and an independent technical evaluation of the final report. (See guidance contained in enclosure (1).) Results of the review shall be promulgated to the Advisory Committee and the CNO Project Officer by OP-96.

f. LCDR John Sewell, SC, USN, is designated OP-96 Study Monitor.

7. Reporting.

a. The study plan is to be submitted to the Advisory Committee within four weeks of the date of this directive.

b. The Project Officer will submit progress reports to OP-966 in accordance with current directives.

c. Meetings of the Advisory Committee shall be called by the Chairman at appropriate times to review and evaluate study progress and trends. The committee shall meet at least once each quarter.

d. Working papers will be submitted to the Advisory Committee as they become available. A draft of the final report is to be submitted by 31 August 1977.

Distribution: (see page 5)

JOHN D. CHASE
Deputy Chief of Naval Operations (Logistics)
Acting

Ser 401/

Subj: Study Directive for an Analysis of Navy Logistic Planning Factors

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GUIDANCE FOR CNO STUDIES AND ANALYSES

1. The assumptions which are of great importance to the outcome of the analysis shall be clearly stated in the introduction to the report. Also, at the beginning of each chapter, annex, or appendix, the complete set of assumptions which are applicable shall be listed. The analysis shall determine the effects of alternative assumptions when these are critical to the study results.

2. The analysis shall identify the key parameters (weapons systems effectiveness values, costing techniques) which greatly affect the study results. Best estimates shall be used for the values of these parameters; in addition, greater and lesser values spanning the range of reasonable values for each parameter shall be used to determine the sensitivity of the study results to changes in these key parameters.

3. A clear and concise description of each model or simulation shall be included in an appendix to the report unless such description is available in an already published document and is referenced in the report. This description shall explain in qualitative terms (including a logic diagram) the general methodology which provides the basis for the model. Detailed design specifications for each model, or reference to a permanent OPNAV file in which these design specifications are held, shall be included in the permanent files of this study.

ENCL (1) TO CNO SER 401/219311 of 7 Apr 1977

MANNING REQUIREMENTS FOR THE ANALYSIS OF NAVY LOGISTIC PLANNING FACTORS PROGRAM STUDY

1. General

a. Personnel assigned to the Study Group should have general or specific responsibilities for Navy logisitc planning factors, and should also be cognizant of the methodology for determination and rationale of planning factor requirements. Each representative will be responsible for keeping his parent command informed of the progress of the study and making the view of his parent command known to the study Project Officer.

b. It is appreciated that personnel having the above qualifications will be involved in other aspects of the overall logistics/supply system. The level of effort required of Study Group members will therefore be limited to part-time participation, probably not exceeding 15% of their time (with the exception of the NARDAC representative, who will probably be required about 25% of the study time).

2. Composition

Organization	Rank	Specialty
OP-01	LCDR/CDR Civ. Equiv.	Manpower/Personnel Analyst
OP-04 (OP-40)	GS-14	CNO Project Officer
OP-04 (OP-41)	LCDR/CDR Civ. Equiv.	Logistics Analyst/ Mobilization Planner
OP-06 (OP 605)	LCDR/CDR Civ. Equiv.	Analyst
CMC	MAJOR/CAPT Civ. Equiv.	Analyst
Navy Regional Data Automation Center, Washington (NARDAC)	LCDR/CDR Civ. Equiv.	ADP Systems Analyst
OP-96 (OP-964)	LCDR/CDR Civ. Equiv.	Study Monitor
NAVMAT 04	LCDR/CDR Civ. Equiv.	Logistics Analyst

NAVAIR	LCDR/CDR Civ. Equiv.	Logistics Planners
NAVELEX	LCDR/CDR Civ. Equiv.	Logistics Planners
NAVFAC	LCDR/CDR Civ. Equiv.	Logistics Planners
NAVSEA	LCDR/CDR Civ. Equiv.	Logistics Planners
NAVSUP	LCDR/CDR Civ. Equiv.	Logistics Planners
BUMED	LCDR/CDR Civ. Equiv.	Logistics Planners

3. Reporting. All personnel shall report by telephone to the CNO Project Officer (695-5109) not later than ten days from the date of this directive.

Note: Subsequent to the initial meeting of the Study Group, minor adjustments may be made to incur an optimum balance of personnel assigned.

Enclosure (2)

APPENDIX B

STUDY PLAN

Study Plan for an Analysis of Navy Logistic Planning Factors

Ref: (a) Study Directive, Ser 401/219311, dated 7 April 1977

1. Tasks

a. Task 1. Identify and review automated and manual systems currently used in developing, reporting, and utilizing Navy logistic planning factors.

(1) Subtask 1-1. Conduct a search to ascertain those automated and manual systems currently used in developing, reporting, and utilizing Navy logistic planning factors.

(2) Subtask 1-2. Interview key personnel involved in subtask 1-1 to determine the suitability of current Navy logistic planning factors in providing data required for operational planning.

b. Task 2. Identify, acquire, and categorize data concerning existing Navy logistic planning factors.

(1) Subtask 2-1. Identify and acquire those Navy logistic planning factors utilized in the Planning Factors File (PFF) of the Joint Operating Planning System (JOPS III) Movement Requirements Generator (MRG).

(2) Subtask 2-2. Compare those Navy logistic planning factors identified in subtask 2-1 with those utilized in industrial mobilization planning and in the War Reserve Material Requirements (WRMR).

(3) Subtask 2-3. Catalog Navy logistic planning factors according to use and applicability.

c. Task 3. Review and analyze each Navy logistic planning factor category for supporting rationale, developmental methodology, validity, and credibility.

(1) Subtask 3-1. Interview key logistic personnel to determine rationale and development methodology used to compile the existing Navy logistic planning factors.

(2) Subtask 3-2. Interview key planning personnel to determine the validity and credibility of the existing Navy logistic planning factors.

(3) Subtask 3-3. Identify those Navy logistic planning factors requiring redefinition or revision, and those logistic areas in which no planning factors are available.

(4) Subtask 3-4. Prepare a working paper consolidating findings of these tasks.

d. Task 4. Prepare a draft final report incorporating the findings of the three tasks and recommending future courses of action. Included in the report shall be the following:

(1) The rationale and methodology used in developing existing Navy logistic planning factors, the validity and credibility of that rationale and methodology, and recommendations for changes and justification thereof.

(2) The usefulness, completeness, and status of existing automated and manned systems for developing, reporting, and using Navy logistic planning factors, and recommendations for design, development, and implementation of a new system, if required, to fully support Navy logistic planning requirements for JOPS III, industrial mobilization, and the WRMR, and to respond to variations in planning scenarios based on the DPPG and JSCP.

(3) The Navy logistic planning factors that are valid and applicable as they now exist, those that need elimination or revision, and additional factors that need to be developed.

(4) Recommendations as to the level of detail to which Navy logistic planning should be addressed with respect to various objectives, i.e., gross level by supply class for transportation planning versus detailed level by stock number for the WRMR. Included shall be recommendations for the development of new computational methodologies for these situations.

(5) The adequacy of NAVMAT P4000-2, and recommendations for changes/additions/deletions to improve its usefulness.

This draft report will be placed in final form after comments from all involved parties have been reviewed and incorporated into the report. Subsequently, presentation material, as requried, shall be prepared for breifing of concerned Navy personnel.

2. Scope and Depth. The study will encompass a survey of current systems utilizing Navy logistic planning factors, a detailed inspection of the rationale and methodology used in developing the existing factors, and a determination of their validity and applicability to present and future needs. Based on the findings of the study, recommendations will be drafted indicating those factors which are valid and

applicable for current and future planning, those which should be eliminated or revised, and the requirements for development of additional factors.

3. Manpower Allocation. Tasks 1 through 4 will require the services of the project officer and contractor support. The projected level of contractor support is approximately 15 manmonths of effort extending over a period of 10 months.

Study Group members, being experts in their respective areas, will be called upon to provide inputs to the study within their areas of expertise relative to the planning factors and the method of computation.

The CNO Project Officer will provide initial points of contact for contractor information. The Advisory Committee will review the working paper and reports and will review and evaluate study progress and findings.

4. Funding Allocation. Information Spectrum, Inc. will support this study under ONR Contract Number N00014-76-C-1130 as expanded tasks to that contract. Approximate funding is $56,931.00 for accomplishment of tasks 1 through 4 by Information Spectrum, Inc. and $3,069.00 to be retained for travel of Navy Personnel. Included in the $56,931.00 is $5,533.00 for travel of contractor personnel to Norfolk, VA., Honolulu, Hawaii, Stuttgart, Germany, London, UK., Fort Lee, VA., and Wright-Patterson AFB, Ohio.

5. Other Resources. Travel will be required to Norfolk, London, Honolulu, and Stuttgart to interview CINC personnel regarding the rationale and methodology used in developing their factors, their validity and their utilization for planning. Army personnel at Fort Lee and USAF personnel at Wright-Patterson AFB will be interviewed to ascertain the rationale and methodology used in developing their factors, and possible interface with the Navy.

6. Task Schedule.

a.	Contractor on board:	2 Mar 1977
b.	Study Directive Signed:	7 Apr 1977
c.	Study Plan approval:	22 Apr 1977
d.	Task 1:	15 Jul 1977
e.	Task 2:	15 Jul 1977
f.	Task 3:	15 Jul 1977
g.	Draft final report:	31 Aug 1977
h.	Complete final report:	30 Nov 1977
i.	Prepare presentation material:	30 Dec 1977

7. Specific Guidance. The primary purpose of the study is to determine whether existing Navy logistic planning factors are sufficiently valid and credible for inclusion in the Logistic Annex of the FY'78 Joint Strategic Capabilities Plan (JSCP). To ensure the validity and credibility of these factors, the study shall:

a. Conduct a critical examination of all logistic planning factors. Validity, credibility, and supporting rationale and methodology shall be the prime considerations in the examination. Emphasis shall be placed on those factors contained in the Planning Factors File (PFF) of the Joint Operations Planning System (JOPS III) Movement Requirements Generator (MRG).

b. Include a scrutiny of the rationale and development methodology for these factors, and determination shall be made as to their reliability and applicability to present and future needs. A recommendation for the development of new or revised rationale and methodology procedures which will ensure the provision of validated factors in the future shall be made.

c. Identify each automated and manual system using Navy logistic planning factors and define its involvement, scope, operational area, validity, overlap with other systems, and operational condition. The usefulness of each system shall be determined and recommendations made for changes or development necessary to provide a total, responsive system to support Navy's future requirements.

d. Ensure that all field activities providing or using Navy logistic planning factors are thoroughly investigated and key personnel interviewed to ensure adequate data for validating or revising existing factors and for basing recommendations for the development of new factors.

e. Due to recent DOD changes in logistic guidance, consideration should be given to the level of planning necessary for JOPS relative to industrial mobilization and the WRMR, and whether the level of detail required for supply and procurement is compatible with these plans.

8. Methodology. The analytical methods to be used in this study include document search, interviews, matrix tabulations, model reviews, categorizing, and reporting.

9. Effectiveness Criteria. Not applicable.

10. Reports.

a. Progress reports shall be submitted to OP-964 in accordance with OPNAVINST 5000.30.

b. Working paper shall be submitted upon completion of Task 3.

c. Draft final report shall be submitted for review and comment.

d. Final report shall be submitted, after the draft has been reviewed and commented upon, incorporating the approved comments.

e. Presentation material for use in briefing Navy personnel shall be prepared and submitted upon call.

11. Coordination. The study group shall coordinate with the CNO Project Officer, the Advisory Committee, OP-96 Study Monitor, and other individuals/agencies as appropriate.

APPENDIX C

Brief Discussion of Joint Operation Planning System (JOPS)

APPENDIX C

Brief Discussion of Joint Operation Planning System (JOPS)

A. Background

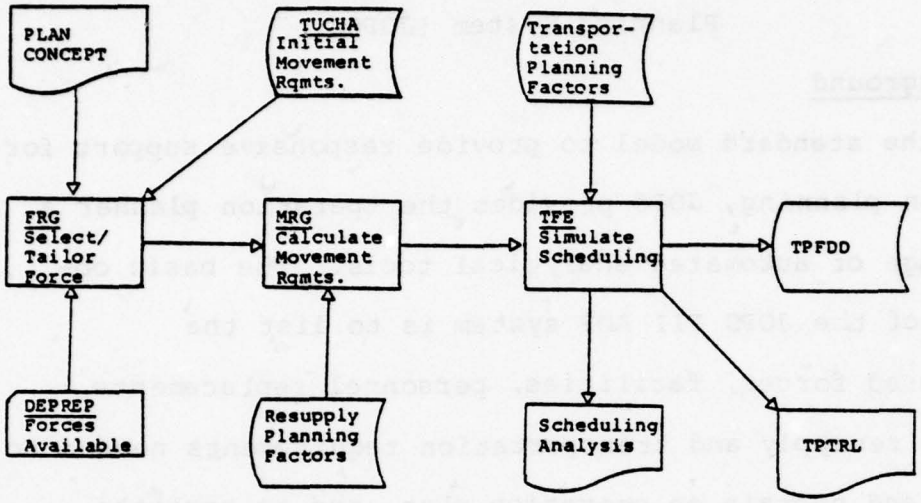
As the standard model to provide responsive support for operation planning, JOPS provides the operation planner a wide range of automated analytical tools. The basic objective of the JOPS III ADP system is to list the time-phased forces, facilities, personnel replacements, materiel resupply and transportation requirements needed to support and sustain an operation plan, and to test the feasibility of operation plans with regard to strategic transportation.

In January 1972, the acquisition of new Worldwide Military Command and Control System (WWMCCS) hardware was approved requiring JOPS program development to conform to WWMCCS hardware and software standards. The JOPS III software is a hierarchial structure with the basic system component being the routine/subroutine. Groups of routines/subroutines form programs which, when logically grouped by function, constitute a module. The diagram on the following page illustrates this information flow. The JOPS III ADP Support System is divided into:

a. Software, containing application programs:

- System Monitor (SM) - ADP software supervisor of the JOPS III application programs. Its primary purpose is

to provide the "user/machine interface" between the planner and the application software.



Legend

DEPREP - Deployment Reporting System
FRG - Force Requirements Generator
MRG - Movement Requirements Generator
TFE - Transportation Feasibility Estimator
TPFDD - Time Phased Force Deployment Data
TPTRL - Time Phased Transportation Requirements List
TUCHA - Type Unit Characteristics

FIGURE C-1 JOPS INFORMATION FLOW

- Force Requirements Generator (FRG) - provides the military planner the capability to automatically generate and individually tailor Time-Phased Force and Initial Materiel Deployment Data (TPFDD) to support joint operation plans. The FRG is unit oriented.

- Movement Requirements Generator (MRG) - provides the capability to automatically generate both unit and non-unit related cargo and personnel requirements based upon the forces to be supported and the duration of the planned operation by using resupply oriented Logistic Planning Factors (LPF).

- Transportation Feasibility Estimator (TFE) - during the plans development, provides automated assistance to the planner in evaluating the gross feasibility of an OPLAN in terms of strategic movement. The strategic movement includes forces (units) and their accompanying cargo as well as the resupply cargo required to sustain those forces for the duration of the contingency. Operation of the TFE is dependent upon transportation oriented LPFs.

- TPFDD/Interface (T/I) - performs the primary function of reformatting and summarizing data in the Deployment Data file, as reported through the DEPREP system, to create the TPFDD file for processing by the FRG, MRG, and the TFE programs. This program provides also the capability to sort the TPFDD file, compute and analyze facility workloads, and compute and analyze the strategic lift required, both air and sea, to move a force from port-of-embarkation (POE) to port of debarkation (POD).

b. File Maintenance Programs

c. Data Base Files

B. Movement Requirements Generator (MRG)

Resupply LPFs form an important basis as input to the MRG as a part of the Planning Factor File (PFF). The MRG is used to generate the time-phased non-unit related personnel and materiel requirements for an OPLAN.

These movement requirements specify the number of replacement personnel and amount of materiel (deploying equipment, resupply cargo, supply build-up in country, and retrograde) necessary to support the OPLAN within its stated operation time frame. These MRG-generated movement requirements in conjunction with the FRG-generated force requirements comprise the total movement requirements of an OPLAN.

The MRG application program updates the TPFDD file with ports of support and geolocation country codes for each force requirement by extracting this information from the Logistics Data (LOGDA) file. This updated TPFDD file contains the total movement requirements for an OPLAN. The TPFDD file is then passed on to the TFE application program for the transportation simulation of all movement requirements in the OPLAN.

The MRG is composed of six functional modules, as follows:

- Module M10 - Create/Update Planning Factors
- Module M15 - MRG File Paging
- Module M20 - Generate Movement Requirements
- Module M30 - Aggregate non-unit related cargo requirements
- Module M60 - PFF Initialization/Master file generation
- Module M70 - LOGDA File Maintenance

The above modules which are of main concern to the study are the M10, M20, and M60 since each works with planning factor input. A brief description of the composition of each follows:

- Module M10 - This module provides the planner with the capability to construct the PFF which is needed to generate non-unit related movement requirements. The PFF is plan dependent in that the planning parameters are structured generally according to the scenario of the OPLAN and how the movement requirements are to be generated. It is in the PFF that the plannner states the MRG problem. Planner inputs which are applied to the PFF include the following:

  a. OPLAN duration from D-day (360-day maximum)

  b. Increments, or frequency of movements, for resupply, supply build-up, and personnel replacement, in terms of days per increment specified for up to four time-periods spread over the duration of the OPLAN.

  c. Time periods during which a percentage of non-POL resupply will move by air specified by Service and resupply category for up to twenty-four periods.

  d. Percentage adjustment of U.S. personnel attrition factors to compensate for differing attrition rates in off-shore countries.*

*Off-shore: In theater, but not in objective area country.

e. U.S. personnel attrition factors specified by Service.

f. Percentage distribution of resupply and supply build-up movement requirements among up to three POEs specified by Service and resupply category.

g. Supply build-up policy in terms of start day, duration of build-up period, and target level (days of supply) specified by Service and resupply category.

h. Retrograde cargo requirements and intra-country cargo requirements, expressed as a percentage of resupply cargo throughout specified by Service and objective area country POD.

i. Resupply LPFs for up to thirty-four classes/subclasses of supply* specified by Service for four U.S. Services and up to three Free World Military Assistance Forces (FWMAF) Services. (For nonbulk POL commodities, the LPFs are expressed in pounds/man/day. For bulk POL commodities, the LPFs are expressed in gallons/man/day.)

j. Criteria for aggregating classes/subclasses of supply and their resupply LPFs, into fourteen or fewer resupply categories specified in terms of the desired resupply categories and their constituent classes/subclasses of supply.

*JCS Publication Number 6 identifies cargo into 10 classes of supply, sub-divided into 34 subclasses of supply. The definitions are included in Appendix I of this report.

k. Percentage adjustments for application to the resupply LPFs to compensate for different theater (Service) consumption specified by Service and class/subclass of supply. (Combat Intensity Factor).

l. Percentage adjustment for application to the resupply LPFs to compensate for consumption rate differences between the off-shore countries and objective area countries.

m. Objective area country and off-shore country resupply start days relative to the beginning of the OPLAN (D+0) specified by country for in-place personnel and by Service and country for deploying forces.

n. Numbers of off-shore U.S. personnel specified by Service and country.

o. Definitions of standard airports and seaports within Continental United States (CONUS) and off-shore countries specified by country.

p. Average travel time, in days, from intermediate locations to objective area country Port-of-Support specified by objective area country.

q. Average travel time, in days, from objective area country ports-of-support to destination specified by country and type of port-of-support (i.e., airport, general seaport, ammo seaport, and POL seaport).

r. Objective area country(s) PWRMS cutoff days specified by Service, country, and resupply category.

s. Numbers of FWMAF personnel to be resupplied in the objective area country(s) specified by geographic location code and FWMAF Service.

t. Short Ton to Measurement Ton (ST-to-MT) conversion multipliers specified by Service and class/ subclass of supply.

- Module M20 - This module generates the non-unit related cargo and passenger movement requirements and adds them to the TPFDD file. A consistency check program ensures that a consistent set of planning factors exist in the PFF. This module generates an updated TPFDD and aggregates the contents. The functions performed are as follows:

a. Aggregate the qualifying entries in the TPFDD file.

b. For each TPFDD File record (or set of aggregated records produced as a result of the action described in paragraph a, above):

(1) Modify each of the class/subclass of supply LPFs using appropriate adjustments.

(2) Aggregate the class/subclass of supply LPFs into fourteen or fewer resupply category consumption factors. Compute the unit-oriented daily consumption rate for each resupply category.

(3) Compute a resupply start day for each resupply category using the following parameters from the PFF:

(a) A deploying unit's POD-to-destination travel time.

(b) Resupply start days which are specified by Service or country (objective area and off-shore) for in-place units.

(c) Resupply start days which are specified by Service and country (objective area and off-shore) or POD-latest available date (LAD) for deploying units.

(4) Compute the number of days of accompanying supply required using the following parameters from the PFF:

(a) PWRMS cut-off days specified by objective area country, Service, and resupply category.

(b) Deploying units POD-LAD.

(5) Generate a Temporary Working Data File (TWDF) with consumption factors and resupply start days for input to the Resupply/Replacement and Build-up Requirements Programs.

(6) Generate the TPFDD Summary Input Print File. This file will be the input to the Generate TPFDD Summary Input Report Program.

- Module M60 - The primary function is to establish a PFF prior to the initial execution of MRG for an OPLAN. For example, a force list is developed using the FRG. But, before this force list can be processed by the MRG, a PFF

must be established within the system. M60 allows the planner to establish the initial PFF. This PFF may then be updated and used in the generation of movement requirements in the MRG. The initial PFF may be established in either (1) blank PFF (one without data) and then update the file with planning parameters using module M10, or (2) recall a specific PFF from a saved tape for a particular OPLAN and/or scenario and then update the file using Module M10.

The PFF accepts materiel consumption rate data in pounds/man/day, gallons/man/day, pounds/unit/day, or gallons/unit/day only, identified to the thirty-four subclasses of supply. Annex B of the JSCP is formatted in this manner also. Identification of this consumption to a force list expressed in Unit Type Code* (UTC) per unit of time is necessary.

C. Transportation Feasibility Estimator (TFE)

Logistic transportation planning factors form an important basis as input to the TFE which is the next step in the planning cycle. The TFE is a simulation of the transportation aspect of the strategic movement problem. This simulation is accomplished by utilizing the movement requirements previously developed by the MRG to determine if the transportation network is adequate for the job. It involves the selection of seaports, airfields, ships, aircraft, and landing craft, and, the use of these assets in

*UTC is a notional grouping of homogeneous units.

simulating the movement of personnel, equipment, and materiel in given scenarios. This capability of selection and simulation is provided by the TFE modules described herein. The planning process is highly interactive and normally requires multiple iterations for every plan. The overall flow with respect to the TFE was also depicted on page C-3. In examining the TFE modules it should be understood that while the CINCs' logistic plans divisions are the primary user organizations, they are working from a force list generated by the operations planners. While these modules are for the purpose of logistic feasibility analysis, such analysis cannot be done in isolation.

The TFE modules fall into three basic categories: input preparation, simulation, and output preparation. The modules that are planning factor dependent are in the input category:

a. Input preparation consists of first taking the MRG updated TPFDD file and selecting the data actually needed for simulation such as force identification, tonnages, passengers, origins, required delivery dates. Having done this, it is then necessary to determine what ports, air and sea, are involved and to retrieve the characteristics of those ports. In conjunction with this, the distances between the ports based on such things as canal openings and over-flight rights must be calculated by the planner. The

last step in the input phase is to allow the user to select the ships and aircraft that are to be utilized in the simulations. Two major points should be emphasized. First, the air and sea simulations are two completely seperate activities. Secondly, while the use of static files/tables is stressed, the user has considerable flexibility in modifying any data he chooses. The static files contain the transportation planning factors. The three major files of Navy interest are:

- Channel Distance File - the distance between ports. (Site unique)
- Port Characteristics file - port throughput constraints.
- Standard Ship/Aircraft Characteristics File - ship speed and cargo carrying capabilities.

b. The next major phase is simulation. This is the heart of the TFE and utilizes the input data previously prepared. The models attempt, based on programmed user rules, to simulate the selecting and loading of vehicles at the ports of embarkation, assembly of convoys if desired, transiting to and unloading at the ports of debarkation as well as providing an analysis of scheduled closures vs. the planners required closures.

c. The last phase of TFE is output preparation. The primary goal is to present the data developed in the structured formats required and to permit reduction of

potentially voluminous reports to more manageable size. The hard copy Time Phased Transportation Requirements List (TPTRL), the primary statement of transportation data, including supporting reports, is generated from all the data developed and simulations as depicted on page C-3 of this Appendix.

THE JOINT CHIEFS OF STAFF
WASHINGTON, D.C. 20301

SM-774-76
16 September 1976

MEMORANDUM FOR: Chief of Staff, US Army
Chief of Naval Operations
Chief of Staff, US Air Force
Commandant of the Marine Corps
Commander in Chief, Aerospace Defense Command
Commander in Chief, Atlantic
US Commander in Chief, Europe
Commander in Chief, Pacific
Commander in Chief, US Readiness Command
Commander in Chief, US Southern Command
Commander in Chief, Strategic Air Command
Director, Defense Communications Agency
Director, Defense Intelligence Agency
Director, Defense Supply Agency
Director, Joint Staff

Subject: Added Terms of Reference for a Logistic Factors File To Be Used by the Joint Operation Planning System Movement Requirements Generator

1. Reference SM-451-75, 11 August 1975, "Expansion of the Terms of Reference for the Joint Operation Planning System Interim Software."

2. In approving the reference, the Joint Chiefs of Staff directed the development of a logistic planning factors file, in coordination with the Services and CINCPAC. The added terms of reference for a Logistic Factors File to be used by the Joint Operation Planning System Movement Requirements Generator are contained in the Appendix.

3. The Director, Joint Staff, in coordination with the Services, will develop, implement, and distribute the Logistic Factors File in Annex B to JSCP FY 78.

For the Joint Chiefs of Staff:

P. M. HARTINGTON
Captain, USN
Secretary

Joint Staff action assigned to J-4 per DJS

Attachment (1) to Appendix C

APPENDIX

ADDED TERMS OF REFERENCE FOR A LOGISTIC FACTORS FILE TO BE USED BY THE JOINT OPERATION PLANNING SYSTEM MOVEMENT REQUIREMENTS GENERATOR

1. Requirement. The Joint Operation Planning System (JOPS) Movement Requirements Generator (MRG) requires the input of Service resupply and personnel replacement planning factors in order to determine total non-unit-related personnel and materiel requirements to sustain forces for the duration of an OPLAN. The logistic planning factors utilized have a significant impact on OPLAN feasibility since they are a major determinant of wartime personnel replacements, resupply material requirements, and/or lift requirements to support a joint operation. It is essential, therefore, that current Service-approved logistic factors be utilized by joint operation planners and that these factors be maintained in an approved OPLAN guidance document which is subject to annual Service review and approval.

2. Objectives

a. Service-approved logistic factors for joint operation planning will be specified in Annex B to JSCP in order to insure their standardized application by all commands and to facilitate annual Service review and update.

b. Services will submit logistic factors and planning points of origin data for materiel and personnel replacements for inclusion in Annex B to JSCP in accordance with the formats contained in the Annexes hereto. Formats will be adapted by each Service to satisfy its Service-unique logistic requirements. Such adaptations will be designed to conform with the input parameters of the JOPS III movement requirements generator where feasible. Adjustments to refine or improve the formats further may be staffed during the annual Annex B to JSCP review cycle.

c. The manually formatted logistic factors in Annex B to JSCP provide the vehicle for insuring that joint operation planners

use current logistic factors which have kept pace with Service requirements for increased readiness and deployability and new materiel and weapon acquisitions.

d. The Services will provide their initial logistic factor input for the annual update cycle of Annex B to JSCP FY 78 to begin in December 1976.

d. Service component planners will review and adjust the Service-approved resupply factors, as necessary, to meet plan-unique requirements.

f. An automated Logistic Factors File (LFF) for JOPS will be developed in the future based on the LFF data contained in Annex B to JSCP.

3. Responsibilities

a. The Director for Logistics, OJCS, is responsible for:

(1) Coordinating the Service input of logistic factors to be included in Annex B to JSCP.

(2) Monitoring use of the Annex B to JSCP logistic factors during the joint operation planning and review process.

(3) Development of a JOPS automated capability to calculate resupply/replacement for OPLANs based upon the LFF.

b. The Services are responsible for:

(1) Developing, defining, and validating the logistic planning factors which they require to be used for joint operation planning.

(2) Providing the logistic factors defined in Annexes B, C, and D hereto to the Director for Logistics, OJCS, for inclusion in Annex B to JSCP.

ANNEX A

SUPPLY SUBCLASSES
TO BE USED IN A LOGISTIC FACTORS FILE IN ANNEX B, JSCP

1A - Rations, Air (inflight)

1C - Rations, Combat

1R - Refrigerated subsistence

1S - Nonrefrigerated subsistence (less combat rations)

2B - Ground support materiel

2E - General supplies

2F - Clothing and textiles

2M - Weapons

2T - Industrial Supplies

3A - POL, Air

3W - POL, Ground (surface)

4 - Construction materiel

5A - Ammunition, Air

5W - Ammunition, Ground

6 - Personal Demand Items

7A - Major End Items, Air

7B - Major End Items, Ground support materiel

7D - Major End Items, Administrative vehicles

7G - Major End Items, Electronics

7K - Major End Items, Tactical vehicles

7L - Major End Items, Missiles

7M - Major End Items, Weapons

7N - Major End Items, Special weapons

8 - Medical materiel

9A - Repair Parts, Air

9B - Repair Parts, Ground support materiel

9D - Repair Parts, Administrative vehicles

9G - Repair Parts, Electronics

9K - Repair Parts, Tactical Vehicles	1
9L - Repair Parts, Missiles	2
9M - Repair Parts, Weapons	3
9N - Repair Parts, Special Weapons	4
9T - Repair Parts, Industrial Supplies	5
10 - Materiel to support nonmilitary programs	6

ANNEX B

1/ LOGISTIC FACTORS

(BASIS: PERSONNEL STRENGTH IN THEATER OF OPERATIONS FOR 1 DAY)

CATEGORY										
PERSONNEL REPLACEMENTS 2/	PARAMETERS 3/									
Consumption by Supply Subclass 4/	COMBAT INTENSITIES 5/					THEATER ADJUSTMENT MULTIPLIERS				ST TO MT MULTIPLIERS
	1	2	3	4	5	EUR	ME	PAC	ARCTIC	
1A										
1C										
1R										
1S										
2B										
2E										
2F										
2M										
2T										
3A 4/										
3W 4/										
4										

Footnotes contained at end of Annex B.

LOGISTIC FACTORS (CONT'D)

CATEGORY	COMBAT INTENSITIES					THEATER ADJUSTMENT MULTIPLIERS				ST TO MT MULTIPLIERS
	1	2	3	4	5	EUR	ME	PAC	ARCTIC	
Consumption by Supply Subclass										
5A 4/										
5W 4/										
6										
7A 4/										
7B 4/										
7D 4/										
7G 4/										
7K 4/										
7L 4/										
7M 4/										
7N 4/										
8										
9A 4/										
9B 4/										
9D 4/										

Footnotes contained at end of Annex B.

CATEGORY	COMBAT INTENSITIES					THEATER ADJUSTMENT MULTIPLIERS				ST TO MT MULTIPLIERS
	1	2	3	4	5	EUR	ME	PAC	ARCTIC	
Consumption by Supply Subclass										
9G 4/										
9K 4/										
9L 4/										
9M 4/										
9N 4/										
9T 4/										
10										

1/ Responsible Service.
2/ Replacements per-man-per-day.
3/ Each Service may provide factors for a maximum of five Service-unique personnel replacement parameters.
4/ Supply classes to be reported will be based on Service determination in pounds-per-man-per-day. Supply classes 3A, 3W, 5A, 5W, 7 series, and 9 series should be reported on the basis of unit type (Annex C); however, these classes may be reported in this format on a "per man" basis based on Service determination. Classes 3A and 3W will be reported in gallons-per-man-per-day if this format is used.
5/ Each Service may provide factors for a maximum of five intensities of combat or for a single average intensity of combat for its forces. Services will provide definitions for intensity of combat for their forces in appropriate Service terminology as footnotes; i.e., perhaps the terms of "steaming" days or "sortie" days, etc.

ANNEX C

1/ LOGISTIC FACTORS

(BASIS: TYPE OF UNIT (UTC) IN THEATER OF OPERATIONS FOR 1 DAY)

UNIT TYPE (UTC) 2/	SUPPLY SUBCLASS	COMBAT INTENSITIES 3/					THEATER ADJUSTMENT MULTIPLIERS				ST TO MT MULTIPLIERS
		1	2	3	4	5	EUR	ME	PAC	ARCTIC	
	3A 4/										
	3W 4/										
	5A 5/										
	5W										
	7A 5/										
	7B										
	7D										
	7G										
	7K										
	7L										
	7M										
	7N										
	9A 5/										
	9B										
	9D										

Footnotes contained at end of Annex C.

_____ LOGISTIC FACTORS

(BASIS: TYPE OF UNIT (UTC) IN THEATER OF OPERATIONS FOR 1 DAY)

UNIT TYPE (UTC)	SUPPLY SUBCLASS	COMBAT INTENSITIES 1	2	3	4	5	THEATER ADJUSTMENT MULTIPLIERS EUR	ME	PAC	ARCTIC	ST TO MT MUTLIPLIERS
	9G										
	9K										
	9L										
	9M										
	9N										
	9T										

1/ Responsible Service.
2/ Factors to be provided for company/battery, ship, squadron, or higher echelon level UTCs as listed in JCS Pub 6, Vol II, Part 6, Ch 3.
3/ Each Service may provide factors for a maximum of five intensities of combat or for a single average intensity of combat for its forces. Services will provide definitions for intensity of combat for their forces in appropriate Service terminology as footnotes; i.e., perhaps in terms of "steaming" days or "sortie" days, etc.
4/ Provide factors for each air and surface bulk fuel types indicated in parenthesis; i.e., 3A(JP4), 3A(JP5), 3A(AVG)--all types AVGAS, 3W(MOG)--all types MOGAS, 3W(DF)--all diesel fuel except marine diesel fuel, 3W(DFM)--diesel fuel marine (ships), 3W(NSF)--Navy special fuel oil. POL consumption factors are to be expressed in gallons-per-UTC-per-day.
5/ Factors are to be in pounds-per-UTC-per-day for repair parts and major items.

ANNEX D

1/ PLANNING POINTS OF ORIGIN

CATEGORY	POINT OF ORIGIN	GEOLOCATION CODE	PERCENTAGE FROM ORIGIN 2/
PERSONNEL REPLACEMENTS			
Supply Subclass 3/			
1A			
1C			
1R			
1S			
2B			
2E			
2F			
2H			
2T			
3A			
3W			
4			
5A			
5W			
6			

Footnotes contained at end of Annex D.

_____ PLANNING POINTS OF ORIGIN (CONT'D)

CATEGORY	POINT OF ORIGIN	GEOLOCATION CODE	PERCENTAGE FROM ORIGIN
Supply Subclass			
7A			
7B			
7D			
7G			
7K			
7L			
7M			
7N			
8			
9A			
9B			
9D			
9G			
9K			
9L			
9M			
9N			

_____ PLANNING POINTS OF ORIGIN (CONT'D)

CATEGORY	POINT OF ORIGIN	GEOLOCATION CODE	PERCENTAGE FROM ORIGIN
Supply Subclass			
9T			
10			

1/ Responsible Service.
2/ Percentages from origins for each supply subclass must total 100 percent
3/ Supply subclasses to be reported will be based on Service determination. Service input will be based on coordination with the Defense Supply Agency where applicable.

APPENDIX D

Summary of Phase I By JOPS Class

APPENDIX D

Summary of Phase I Findings

and Recommendations By JOPS Class

A. Class I - Subsistence (Food)

- Consumption of Class I items is personnel oriented.
- The source of data for Class I consumption is the Navy Food Service Systems Office (NFSSO), Washington, D.C.
- The data span the time period from 1968 to the present.
- NFSSO has developed planning factors and validated them in Fy 1976.
- The Study Group has reviewed the NFSSO data and has concluded that subsistence planning factors are valid and will require minimal manipulation by NFSSO to orient them for JOPS usage.
- The LPFs developed for Class I will represent wartime consumption.

B. Class II - Base Support Materiel

- Consumption of Class II items is equipment related with the exception of Subclasses IIE and IIF which contain administrative and housekeeping supplies, clothing, and textiles.
- Consumption and physical characteristics data will come from the Navy ICP transaction history data contained in the DODMDS data base.

- Resupply LPFs for Class II items are required, and the aggregation method discussed in this report with the DODMDS data base will be used to develop these factors.

- Combat intensity factors will be applied to Class II for consumption.

C. Class III - Petroleum

- Consumption of Class III is dictated primarily by scenario and operation tempo.

- The data base for bulk petroleum WRMR is maintained by OP-413 at NARDAC, Washington, D.C. and is updated on a monthly basis.

- Bulk POL LPFs are required and will be developed by OP-413 with the data base.

- Packaged petroleum consumption and physical characteristics data will come from the Navy ICP transaction history data contained in the DODMDS data base.

- Resupply LPFs for packaged petroleum are required, and the aggregation method in this report with the DODMDS data base will be used to develop these factors.

- The subclasses of supply for POL are to be expanded to include JP-5 and AVGAS for air and Diesel Marine Fuel, MOGAS, and Navy Special Fuel Oil for ground use.

- The LPFs developed for Class III (Bulk POL) will represent wartime consumption.

D. Class IV - Construction Materiel

- Class IV resupply planning factors are scenario oriented.
- Consumption and physical characteristics data will come from Navy ICP transaction history data contained in the DODMDS data base.
- LPFs for Class IV are required, and the aggregation method discussed in this report with the DODMDS data base will be used to develop these factors.
- Combat intensity factors will be applied to Class IV consumption.

E. Class V - Ammunition

- Class V consumption is scenario oriented.
- Potential consumption data is developed in the NNOR process by OP-411.
- The ammunition requirement is updated annually for the POM, by scenario.
- LPFs for Class V are required and will be developed from the NNOR process.
- The LPFs developed for Class V will represent wartime consumption.

F. Class VI - Personal Demand Items (Non-Military Sale Items)

- Class VI planning factors are personnel oriented.
- The source and location of Class VI consumption data is the Navy Resale System Office (NRSO), Brooklyn, New York.

- The LPFs developed for Class VI will represent wartime consumption.

G. Class VII - Major End Items

- Class VII is comprised of major pieces of equipment, such as aircraft, major electronic systems, ground vehicles, associated propellers, shafts, and aircraft engines, etc. Class VII items should be for Navy purposes, equated with principal items as defined in Navy Policy and Standards for Supply Management, NAVSO P-1500. These items are generally subject to two types of usage: (1) normal attrition and (2) combat attrition, including battle damage.

- Usage and physical characteristics data for Class VII items will be derived from the Navy inventory manager transaction history data contained in the DODMDS data base. This data will be reviewed for accuracy by the cognizant command and, if approved, will be converted to LPFs using the aggregation method and combat intensity factors.

- Most Navy Systems Commands (SYSCOMS), as inventory managers for Class VII, feel that replacement of many Class VII items will not occur during contingencies by shipment of replacements to theater, and so LPFs should not include transportation requirements for these items. If SYSCOMS find that for this or other reasons the data derived from the DODMDS files is inaccurate, commands will develop valid LPFs for Class VII items under their cognizance.

H. Class VIII - Medical Materiel

- Consumption of Class VIII materiel is personnel oriented.
- The source and location of Class VIII consumption data is the Naval Medical Material Support Command, (NAVMEDMATSUPPCOM), Philadelphia, Pennsylvania.
- The LPFs developed for Class VIII will represent wartime consumption.

I. Class IX - Repair Parts and Components

- Consumption of Class IX materiel is equipment or weapon system oriented.
- Consumption and physical characteristics data will come from the Navy ICP transaction history data contained in the DODMDS data base.
- LPFs for Class IX are required, and the aggregation method discussed in this report with the DODMDS data base will be used to develop these factors.
- Combat intensity factors will be applied to Class IX consumption.

J. Class X - Materiel to Support Non-Military Programs

- Class X is comprised primarily of materiel used to support the economic development of foreign countries.
- Class X resupply is not pertinent to the objectives of this study.

APPENDIX E

Relevant Resupply LPF Literature Search

APPENDIX E

Relevant Resupply LPF Literature Summary

1. Logistics Reference Data, NAVMAT P-4000-2 (formerly NWIP 11-21).

- Published 30 September 1973
- The Navy logistics information reference
- Incorporates tables displaying logistics information and data (see Attachment 1 to this Appendix)
- For all users of logistics information including CINC Logistics Planners
- Table 1.5, Consumption Data for Supply Categories of Material (Ten Classes)
  - Not updated
  - Pounds/man/day factor for "ashore", "afloat", and "worldwide" by DOD class and subclass by Navy Cognizance Symbol
  - Developed using NAVSUP Publication 295 for consumption data and NAVPERS 15658 and other NAVPERS documents for personnel data
  - Where direct relationship from Navy Cognizance Symbol to DOD subclass not established, a "most appropriate" class chosen
  - Does not identify a factor for bulk POL (Class III) and Ammunition (Class V) (Refers to NNOR and other tables)
- Other tables - may be useful logistics reference data but not related to JOPS LPFs

- All tables are listed in Attachment 1 to this Appendix.

2. OPNAVNOTE C8000 21 Septemer 1976, Non-Nuclear Ordnance Requirements (U), POM 78 Update (NNOR)

- Provides ammunition consumption plans based on scenario
- Updated annually.

3. Naval Warfare Information Publication (NWIP) 11-21

- Developed in early 1950's by the Logistics Research Project of George Washington University under contract to the Office of Naval Research
- Working papers and methodology still available
- Data accumulated on an individual ship or squadron basis from World War II consumption data
- Planning Factor tables for "activities" (POL, ammunition, general stores, and spare parts) provided factors by ship class or aircraft type
- Incorporated the premise that resupply commodities are equipment, personnel, or scenario oriented
- Assumed a "Standard Condition" roughly analogous to a current OPLAN
- Expressed requirements as BBL/Day, Man/Day, MT/Day, or Drum/Day
- Incorporated a Theater Commander judgement factor
- Provided computation method for expressing resupply requirements by major "activities" for one entire force structure.

ATTACHMENT ONE TO APPENDIX E

P4000-2 TABLES

TABLE

1.1 Navy and Marine Corps Monthly Combat Expenditures in Southeast Asia, Mar 69 through Mar 70 (Article 112)

1.2 Ammunition (Measurement Tons) for SEA Moved across Piers at Bangor, Concord, Earle, and Sunny Point Between January 1968 and December 1971 (Article 113)

1.3 Fuel Consumption (Gallons per Hour) (Article 121)

1.3a Fuel Consumption (Gallons per Hour) for Steamships burning ND (Article 121)

1.4 Aircraft Fuel Consumption (Article 122)

1.5 Consumption Data for Supply Categories of Material (10 Classes) (Article 131)

1.6 Monthly Resupply Requirements for Repair Parts and Consumable Stores by ship Type (Article 132)

1.7 Marine Corps Resupply Data (Air and Sea Lift) (Revised) (Article 134)

1.8 Planning Factors for Mail Resupply (Article 135)

2.1 Characteristics of Specific Ammunition Items (Article 210)

2.2 Destroyer Tender Ammunition Allowances (Section 210)

2.3 Representative Surface Ship Ammunition Allowances (Section 210)

2.4 Representative Allowances for Submarines and Submarine Tenders (Section 210)

2.5 AE/AOE Fleet Issue Ammunition Load List Allowance (Section 210)

2.6 Characteristics of Specific Classes of AE/AOE Loads by Weight and Cube (Section 210)

2.7 CVA Stowage Capacity (Long Tons) for Aviation Ammunition (Section 210)

2.8 Loading Guide for CVAs for Selected Aviation Ammunition (Section 210)

2.9 Loading Guide for CVSs for Selected Aviation Ammunition (Section 210)

2.10 Fuel Capabilities of Ships (Barrels) (Section 220)

2.11 Aviation Fuel Capacities of Carriers (Section 220)

2.12 AO Standard Load (In Barrels) (Section 230)

2.13 TAO Standard Load (Section 230)

2.14 Stores Supply Levels (Section 240)

2.15 Characteristics of an AF and an AFS Fleet Load (Subsistence) (Article 241)

2.16 Characteristics of the "B" Ration (1,000 Men per Day for 30 Days) (Article 241)

3.1 Typical Replenishment at Sea Vulnerability Calculation (Alongside AF) (Section 300)

3.2 Transfer-at-Sea Rates (Short Tons or Barrels per Hour) (Section 310)

4.1 Standard Aircraft Squadron/Aircraft Assignments (Section 420)

4.2 Standard Aircraft Squadron/Aircraft Assignment (Not Assigned as Squadrons to CVAs or CVSs) (Section 420)

4.3 Deck Spotting Factors--A-7 Equivalent (Section 420)

4.4 Marine Corps Authorized Allowances for Headquarters Units and Shore Establishments (Section 420)

4.5 Section "B" Initial Outfitting List Numbers for U.S. Navy Aircraft (Section 430)

4.6 Shipping Charateristics of Section "A" Standard Aeronautical and Navy Stock Account Material List (Section 440)

4.7 Shipping Characteristics of Section "B" Aircraft Allowance Lists (Section 440)

4.8 Shipping Characteristics of Section "R" (Aeronautical Electronic Material) Initial Outfitting Lists (Section 440)

4.9 Shipping Characteristics of Section "N" Material Initial Outfitting Lists (Section 440)

4.10 Shipping Characteristics of Section "X" Material Initial Outfitting Lists (Section 440)

4.11 Shipping Characteristics of Aircraft Engines (Section 450)

4.12 Weight (S/T) and Cube (M/T) of Aircraft Deployed to CVA/CVS (Section 460)

4.13 Weight (S/T) and Cube (M/T) of Aircraft Squadrons Deployed to Shore Operating Bases (Section 460)

5.1 Representative Ship and Afloat Staff Allowance and Complements (Section 500)

5.2 Personnel Requirements for Carrier Air Wings (Section 500)

5.3 Tables of Organization for Marine Corps Aviation Units (Revised) (Section 500)

5.4 Transients, Patients, and Prisoners (T.P.&P.) (Article 501)

5.5 Passenger Air Transport Planning Factors (Article 502)

5.6 Passenger Sealift Planning Factors (Article 502)

5.7 Tables of Organization for Marine Corps Ground Units (Article 505)

6.1 Estimated Repair Requirements in Mandays per Ship Month, Sixth Fleet (FY 1967) (Section 610)

6.2 Distribution of Forward Area Repair Support, Sixth Fleet (FY 1967) (Section 610)

6.3 Estimated Repair Requirements in Mandays per Ship Month, Sixth Fleet (FY 1968) (Section 610)

6.4 Distribution of Forward Area Repair Support, Sixth Fleet (FY 1968) (Section 610)

6.5 Estimated Repair Requirements in Mandays per Ship Month, Sixth Fleet (FY 1969) (Section 610)

6.6 Estimated Repair Requirements in Mandays per Ship Month, Seventh Fleet (FY 1967) (Section 610)

6.7 Distribution of Forward Area Repair Support, Seventh Fleet (FY 1967) (Section 610)

6.8 Estimated Repair Requirements in Mandays per Ship Month, Seventh Fleet (FY 1968) (Section 610)

6.9 Distribution of Forward Area Repair Support, Seventh Fleet (FY 1968) (Section 610)

6.10 Estimated Repair Requirements in Mandays per Ship Month, Seventh Fleet (FY 1969) (Section 610)

6.11 Distribution of Forward Area Repair Support, Seventh Fleet (FY 1969) (Section 610)

6.12 Ship Repair and Overhaul by All Naval Shipyards (FY 1969) (Section 610)

6.13 Estimated Repair Capabilities of Tenders and Repair Ships (Section 610)

6.14 Status, Location, and Capabilities of Navy Active and Reserve Floating Dry Docks (Section 610)

6.15 Location and Capability of Floating Dry Docks on Loan or Lease (Section 610)

6.16 Floating Dry Dock Planning Factors and Service Craft Allowance (Section 610)

6.17 Electric Power Capabilities of Tenders and Repair Ships (Section 610)

6.18 Electric Power Requirements for Naval Ship Types and Classes While Being Tended Alongside Tenders and Repair Ships (Section 610)

6.19 Portable Water Capabilities of Tenders and Repair Ships (Section 610)

6.20 Portable Water Requirements for Ships (Section 610)

6.21 Steam Requirements of Ships Alongside and Export Capabilities of Tenders and Repair Ships (Section 610)

7.1 Advanced Base Functional Component Description and Data (Section 710)

7.2 Minimum Requirements for Advanced Base Airfield Surfacing Materials (Average Conditions) (Article 725)

7.3 General Characteristics of a Minimum SATS Installation for Jet Aircraft Using Assisted Takeoffs and Arrested Landings (Article 726)

7.4 Characteristics of Portable Airfield Surfacing (Article 726)

7.5 Some Average Factors for Converting Net Storage Space Required to Gross Space Required for Storage Operation; (Article 728)

7.6 Percentage of Supplies Requiring Covered Storage (Article 728)

7.7 Construction Time Requirements for Selected Projects (Article 751)

8.1 MSC Transportation Capacities (Article 821)

8.2 Major U.S. Flag and U.S. Controlled Commercial Passenger Ships (Article 821)

8.3 Average Characteristics -- U.S. Merchant Marine Cargo Ships (Article 822)

8.4 Maritime Administration Merchant Ship Classification Coding (Article 822)

8.5 Characteristics of MSC and Privately Owned U.S. Flag Tankers (Article 823)

8.6 Significant Dimensions and Capacities of C4 (Article 825)

8.7 Significant Dimensions and Capacities of C3 (Article 825)

8.8 Significant Dimensions and Capacities of C2 (Article 825)

8.9 Significant Dimensions and Capacities of VC2 (VICTORY) (Article 825)

8.10 Aircraft Carrier Cargo Capabilities for Assembled Aircraft (Article 826)

8.11 Hatch, Boom, and Winch Data, U.S. Merchant Marine Cargo Ships (Article 827)

8.12 Characteristics of Notional Ships (Article 828)

8.13 Cargo Density Conversion Table in Long Tons (Articles 829 and 830)

8.14 Cargo Density Conversion Table in Short Tons (Article 830)

8.15 M/T and S/T Conversion Factors by Supply Class (Article 830)

8.16 Density Conversion Factors for Supply Categories of Material (Ten Classes) (Article 830)

8.17 M/T and S/T Conversion Factors for Certain Cargoes to Vietnam (Article 830)

8.18 Liquid Conversion Factors Used in Shiploading (60 F) (Article 831)

8.19 Maximum Permissible Deck Loads in Pounds per Square Foot (Article 834)

8.20 Peacetime (Optimum) Capacity in Measurement Tons (M/T) of Cargo (Article 835 and 836)

8.21 Worldwide Turn-around Cycles from U.S. Ports (New York and San Francisco) for Notional Ships (No ASW) (Article 839)

8.22 Time Required for Steaming Various Distances at Speeds Ranging from 8 to 20 knots (Article 840)

8.23 Uniform Material Movement and Issue Priority System (UMMIPS) (Article 841, 842, 843)

8.24 Vietnam Port Handling Planning Factors (S/T per Day) (1966) (Article 845, 846, 847)

8.25 Aircraft Characteristics (Article 856)

8.26 Aircraft Operational Limitations (Article 857, 858)

8.27 Normal Gross Takeoff Payload at Nautical Mile Ranges (Article 859)

8.28 Worldwide Logistical Aerial Ports (Article 860)

8.29 General Characteristics of Helicopters (Article 861)

8.30 Maximum Payload Capability of Helicopters at Sea Level and STD Temperature (59 F) (Article 861)

8.31 Maximum Payload Capability of Helicopters at 50 Nautical Mile Radius (Article 861)

8.32 Short-term Movement Capability for Pavement or Surface Types (Section 870)

8.33 Short-term Movement Capability for Highway Types (Section 870)

8.34 Maximum Number of Days of Short-term Movements by Pavement or Surface Types (Section 870)

8.35 Truck Capabilities -- Maximum (Article 871)

8.36 Characteristics of Rolling Stock (Article 872, 873)

8.37 Routes Covered by MSC Container Agreements (Article 888)

9.1 Landing Craft Characteristics (Section 910)

9.2 River Assualt Craft Characteristics (Section 910, 920, 930)

9.3 Characteristics of Pontoon Barges (Article 941, 942)

9.4 Cargo and Troop Capacity of Selected Amphibious Ships and Craft (Section 950)

9.5 Specialized Mobile Units - Tactical Support Units (Amphibious) (Pacific) (Section 960)

9.6 Specialized Mobile Units - Tactical Support Units (Amphibious) (Atlantic) (Section 960)

9.7 Specialized Mobile Units - Tactical Support Units (Mine Warfare Forces) (Section 960)

9.8 Specialized Mobile Units - Ordnance Support Units (EOD) (Section 960)

9.9 Specialized Mobile Units - Ordnance Support Units (Miscellaneous) (Section 960)

Articles 1021, 1031, 1032, 1033, 1035

10.1 Admission Rate (Admission per 1,000 Strength per Day) (Article 1041)

10.2 Wounded in Action Admission Rate for Specific Operations (Admissions per 1,000 Strength per Day) (Article 1041, 1042, 1043, 1044)

10.3 U.S. Naval Hospital Ship Capacities (Article 1045)

10.4 Army World War II and Korean War Experience (Article 1046)

10.5 Navy/Marine Corps Vietnam Experience (Article 1046)

10.6 Casualty Carrying Capacity of Aircraft (Article 1047)

10.7 Evacuation Capacities of Fleet Amphibious Ships (Article 1047)

10.8 Evacuation Capacities of MSC Troop-carrying Ships (Article 1047)

11.1 Days of Supply - Pacific Theater (Section 1100)

11.2 Days of Supply - Pacific Theater (Section 1100)

11.3 Days of Supply - Polar Regions (Section 1100)

11.4 Conversion Factors by Class of Supply (Articles 1101 and 1102)

11.5 Characteristics of Standard Army Rations (Section 1100)

11.6 Water Requirements (Section 1100)

11.7 Consumption Data for Supply Categories of Material (10 Classes) for Army (Article 1103)

APPENDIX F

Summary of Interviews

APPENDIX F

Summary of Interviews

A. Navy CINC Logistics Planners - CINCLANTFLT, CINCPACFLT, and CINCUSNAVEUR Representatives

a. CINC Logistic Planners are the users of resupply Logistics Planning Factors (LPF) on the CINC staffs.

b. Resupply LPFs are required to satisfy the CINC JOPS planning requirements.

c. Table 1.5 of Logistics Reference Data, NAVMAT P4000-2 is used as the source of resupply LPFs and is the only source available.

d. Resupply LPFs would be more responsive to CINC requirements if they were adapted to JOPS input requirements.

B. Navy Logistics Planning Factor Sponsors - Naval Supply Systems Command Headquarters (NAVSUP), Naval Facilities Engineering Command Headquarters (NAVFAC), Naval Sea Systems Command Headquarters (NAVSEA), Naval Air Systems Command Headquarters (NAVAIR), Naval Electronics Systems Command Headquarters (NAVELEX), Bureau of Medicine and Surgery (BUMED), Military Sealift Command (MSC), and Office of the Chief of Naval Operations, Ordnance and Energy Management Branches

a. Sponsors are responsible for the development and maintenance of LPFs.

b. Documentation of rationale and methodology of current LPFs is limited to that described in Logistics Reference Data, NAVMAT P4000-2. The descriptive data contained in this publication was insufficient to permit reconstruction of resupply factors.

c. Individuals who participated in the development of Table 1.5 of Logistics Reference Data, NAVMAT P4000-2 are no longer available.

d. Sponsors will provide support in the development of new resupply LPFs.

e. Primary effort should be addressed to resupply LPFs in Table 1.5 of Logistics Reference Data, NAVMAT P4000-2 and in defining a methodology to compute and maintain such factors.

f. MSC validates the rationale and methodology used for the development of the transportation planning factors on a continuing basis.

C. Other Services

Interviews with other Services to determine their methodology to develop resupply LPFs:

1. Army - Development and Readiness Command (DARCOM) and Planning Factors Management Office, Training and Doctrine Command (PFMO):

a. PFMO and DARCOM are the two agencies involved with developing and coordinating Army LPFs.

b. Army items are classified into the ten major DOD supply classes and seventy-seven subclasses.

c. The methodology used in aggregation to seventy-seven subclasses was essentially a manual identification of each line item which took five years to complete.

d. Responsibility for computing LPFs for use in the Army is centralized at the PFMO.

e. Because rationale and supporting methodology is not identifiable, current Army LPF credibility is questioned, and PFMO is in the process of identifying a validation method.

2. Air Force - Air Force Logistics Command

a. Planning factors are currently under review.

b. Air Force information and procedures are under review and would not be useful to the Navy.

D. Navy Food Services Systems Office, Washington, D.C. (NFSSO)

a. NFSSO has Navy Subsistence (Class I) consumption data by FSC and ship type by weight and cube.

b. NFSSO has planning factors which reflect surface unit and submarine usage.

c. Since NFSSO finds there is little variance in subsistence consumption, planning factors are representative and require minimal updating.

d. Planning factors for Subsistence (Class I) were validated in FY 1976 and factors for submarines are being revised.

APPENDIX G

CLASSIFICATION MATRIX

AD-A055 752 OFFICE OF THE CHIEF OF NAVAL OPERATIONS WASHINGTON D C F/G 15/5
AN ANALYSIS OF NAVY LOGISTIC PLANNING FACTORS.(U)
MAR 78 P A FRIES, B A GRUBER, J LEMMO

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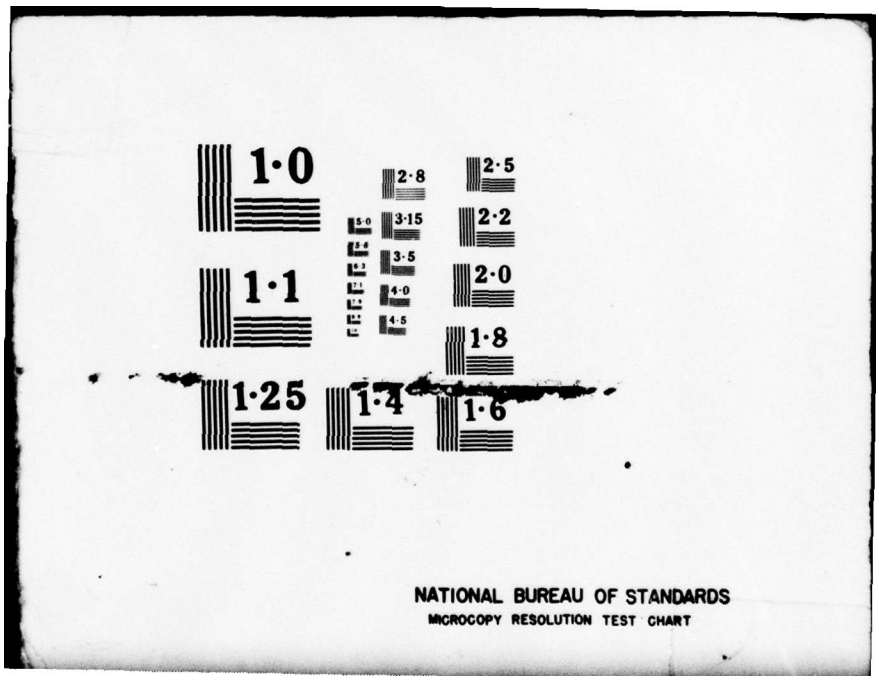
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NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

Table G-1

Navy Cognizance Symbol to JOPS Classification

1H x	2B x	4A IXA	5L IXG	6A D	8A d	9A IXK	0I IIE
1I IIE	2C x	4E VA	5M IXG	6E x	8E VA	9C x	0K IIE
IQ VI	2E VA	4G IXG	5N IXG	6G IIB	8H IXG	9D IIF	0P IIE
1R IXA	2F VIIG	4H IXK	5P D	6H D	8M IIB	9E IIE	0X x
	2H x	4J IIB	5R IXT	6M IIB	8N VIIB	9F IXA	
	2J VIIM	4M IIB		60 IIB	8P D	9G x	
	2M VIIB	4N x		6P D	8R x	9H IXM	
	20 IIB	40 IXB		6R VIIB	8S VW	9I IXA	
	2P D	4P D		6T VW	8T VW	9J IXA	
	2R x	4R IXB		6U x	8U VA	9K IXA	
	2S x	4T VW		6V IXA	8X D	9L VIII	
	2T VW	4U IXM		6X D		9M x	
	2U IXL	4V IXA				9N IXG	
	2V IIB	4X D				90 x	
	2W IIB	4Z IXA				9Q IIE	
	2X D					9S IXL	
	2Z VIIG					9V IXA	
						9W IXA	
						9X x	
						9Y IXG	
						9Z IXT	

D = Delete (FBM/Nuclear)

x = DOD Subclass Depends on FSC

Appear to fall directly into DOD subclass	62
DOD Subclass Appears to Depend on FSC	15
Deleted (FBM)	12
TOTAL	89

Matrix examination indicates that of the eighty-nine COG symbols sixty-two can be identified directly to a single JOPS class/subclass of supply, fifteen can be categorized to JOPS class/subclass of supply depending upon the particular FSC, and twelve can be deleted because they deal with nuclear weapons and FBM materiel.

APPENDIX H

DODMDS Data Base

APPENDIX H

DODMDS Data Base

The purpose of the DODMDS study is to analyze the Department of Defense materiel distribution system and optimize the number of supply depots. The DODMDS data base is composed of several different types of data files, both in terms of the extent of data processing required to produce them and in information content referring to such data as catalog data, requisition data, or requisition data with appended catalog data. Extent of data processing refers to the number of steps of extracting, sorting, merging, and aggregating required to produce a particular file from raw source files.

There are five main types of data files which comprise the DODMDS data base and each file type is characterized by organizational identity, record format, record sequence, and informational content or functional use. Each type of file is described below:

- The first main files are the source files, which contain the data files requested by and sent to the DODMDS Study Group by the various field activities of DOD services/agencies including Navy ICPs.

- The second main files are the extract files created from selected data elements of the source files. The order of records is not changed during this process and the resultant files remain grouped by original service/agency.

The extracted data elements contain the same characters as were in the source file. The first-pass extract file is created without any consideration of the meaning or validity of the characters comprising each data element. Subsequent processing steps validate the content of each of the data fields, fill voids according to specified rules, or reject the invalid records to special exception files for separate analyses.

- The third main files are the intermediate files consisting of a depot shipments file, a catalog file, a transportation file, and a contract file. The contents of these files are roughly analogous to the source files, are primarily of interest to DODMDS, and indicate how the preparation of the data base was organized into discrete, verifiable tasks.

- The fourth files are the master transaction files and the master reference files. The DODMDS data preparation effort culminates with the creation of these files including:

DODMDS Master Transaction Files

1. Depot shipments master file (wholesale)
2. Depot procurement receipts (D4) master file (wholesale)
3. Depot non-procurement receipts (D6) master file (wholesale)
4. Direct delivery shipments (B2) master file (wholesale)
5. Depot detail shipments issues master file
6. Depot retail procurement receipts master file
7. Depot retail non-procurement receipts master file

DODMDS Master Reference Files

1. Catalog master file
2. Customer master file
3. DCASR (vendor/contractor) master file
4. DLSC Freight data master file
5. NSN/DODMDS Product group cross-reference file
6. Retail, asset (location/status) master file
7. Wholesale, asset (location/status) master file

- The fifth file within the DODMDS data includes the special analyses files which were created to perform tasks specifically related to DODMDS purposes.

- The DODMDS "Mini Ship I" file forms the basis for the DODMDS NSN aggregation. Attachment 1 presents the specific data elements of this file.

- The time period covered by the DODMDS data base is twelve months (1 October 1974 through 30 September 1975).

Attachment 1

DODMDS Data Elements (Mini Ship I)*

1. NSN (FSC/NIIN)
2. Document Number
3. DODAAC (Ship to "UIC")
4. Priority Designator
5. Requisition Receipt Date (ICP)
6. Shipping Depot
7. Quantity Shipped
8. Date Available for Shipment
9. Date Shipped
10. Mode
11. Type of Action Code
12. MRO Generation Date
13. Price
14. Source of Supply
15. Security Code
16. Repairability
17. Management Control
18. TL Class
19. LTL Class
20. CL Class
21. Water Commodity Code
22. Type Cargo Code
23. Unit Pack Length
24. Unit Pack Width

25. Unit Pack Depth

26. Unit Weight

27. Unit Cube

28. Customer Number

29. ZIP

30. Service Code

31. ICP Code

32. Product Number

33. Catalog Data Flag

* Created from Wholesale Shipment file. Forms basis of NSN roll-up. Also used for Retail Shipments.

APPENDIX I

JCS Publication 6 Vol. II Part 5 Chapt I

TABLE 23

SUPPLY CLASS-SUBCLASS CODES

Supply Class (G cc 47)	Subclass (G cc 48)
1 - Subsistence (Food)	A - Air (inflight rations)
	R - Refrigerated subsistence
	S - Non-refrigerated subsistence (less combat rations)
	C - Combat rations (includes gratuitous health and welfare items)
2 - Clothing individual equipment tentage, organizational tool sets and tool kits, hand tools and administrative and housekeeping supplies and equipment.	B - Ground support material (includes power generators and construction, barrier, bridging, fire-fighting, petroleum, and mapping equipment)
	E - General supplies
	F - Clothing and textiles
	M - Weapons
	T - Industrial supplies (e.g., bearings, block and tackle, cable, chain, wire rope, screws, bolts, studs, steel rods, plates, and bars)
3 - POL: Petroleum, fuels, lubricants, hydraulic and insulating oils, preservatives, liquid and compressed gases, bulk chemical products, coolants, deicing and antifreeze compounds--plus components and additives of such products, including coal.	A - Air
	W - Ground (surface)
4 - Construction: Construction materials including installed equipment and all fortification/barrier materials.	None

TABLE 23

SUPPLY CLASS-SUBCLASS CODES

Supply Class (G cc 47)	Subclass (G cc 48)
5 - Ammunition: Ammunition of all types (including chemical, biological, radiological, and special weapons), bombs, explosives, mines, fuzes, detonators, pyrotechnics, missiles, rockets, propellants, and other associated items.	A - Air W - Ground
6 - Personal Demand Items (Nonmilitary Sale Items)	None
7 - Major End Items: A final combination of end products ready for its intended use; e.g., launchers, tanks, mobile machine shops, and vehicles	A - Air B - Ground support material (includes power generators and construction, barrier, bridging, fire-fighting, petroleum, an mapping equipment) D - Administrative vehicles (commercial vehicles used in administrative motr pools) G - Electronics K - Tactical vehicles L - Missiles M - Weapons N - Special weapons
8 - Medical material, including medical peculiar repair parts	None
9 - Repair Parts (Less Medical Peculiar Repair Parts): All repair parts and components, including kits, assemblies, and subassemblies (repairable and nonrepairable) required for maintenance support for all equipment.	A - Air B - Ground support material (includes power generators and construction, barrier, bridging, fire-fighting, petroleum, and mapping equipment)

TABLE 23

SUPPLY CLASS-SUBCLASS CODES

Supply Class (G cc 47)	Subclass (G cc 48)
9 - (continued)	D - Administrative vehicles (commercial vehicles used in administrative motor pools)
	G - Electronics
	K - Tactical vehicles
	L - Missiles
	M - Weapons
	N - Special Weapons
	T - Industrial supplies (e.g., bearings, block and tackle, cable, chain, wire, rope, screws, bolts, studs, steel rods, plates, and bars)
0 (10) - Material to support Non-military programs; e.g., agricultural and economic development not included in classes 1 through 9.	None

APPENDIX J

Glossary

APPENDIX J

Glossary

ABFC	Advanced Base Functional Component
ADP	Automatic Data Processing
AFLC	Air Force Logistics Command
AVGAS	Aviation Gasoline
BUMED	Bureau of Medicine and Surgery (Navy)
CARESS	Enhanced Contingency Ammunition Requirements and Supportability System
CIF	Combat Intensity Factor
CINC	Commander-in-Chief
CINCLANT	Commander-in-Chief Atlantic
CINCLANTFLT	Commander-in-Chief Atlantic Fleet
CINCPAC	Commander-in-Chief Pacific
CINCPACFLT	Commander-in-Chief Pacific Fleet
CINCUSNAVEUR	Commander-in-Chief U.S. Naval Forces Europe
CNO	Chief of Naval Operations
CONUS	Continental United States
DARCOM	Development and Readiness Command (Army)
DEPREP	Deployment Reporting System, Joint Operation Planning System
DLA	Defense Logistics Agency
DODMDS	Department of Defense Materiel Distribution Study
FRG	Force Requirements Generator of the Joint Operation Planning System

FSC	Federal Supply Class
FWMAF	Free World Military Assistance Forces
GSA	General Services Administration
ICP	Inventory Control Point
JOPS	Joint Operation Planning System
JSCP	Joint Strategic Capabilities Plan
JSOP	Joint Strategic Objectives Plan
LAD	Latest Available Date
LOGDA	Logistics Data
LPF	Logistic Planning Factor
LT	Long ton
MOGAS	Motor Gasoline
MRG	Movement Requirements Generator of the Joint Operation Planning System
MSC	Military Sealift Command
MT	Measurement ton
NARDAC	Navy Regional Data Automation Center, Washington, D.C.
NAVAIR	Naval Air Systems Command
NAVELEX	Naval Electronics Systems Command
NAVFAC	Naval Facilities Engineering Command
NAVMAT	Naval Material Command
NAVMEDMATSUPPCOM	Naval Medical Material Support Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NFSSO	Navy Food Service Systems Office
NIIN	National Item Identification Number
NNOR	Non-Nuclear Ordnance Requirements (Navy)

NRSO	Navy Resale Systems Office, Brooklyn, NY
NSN	National Stock Number
NWIP	Naval Warfare Information Publication
OJCS	Organization of the Joint Chiefs of Staff
OPLAN	Operation Plan
PFF	Planning Factors File used in the Joint Operation Planning System
PFMO	Army Planning Factors Management Office, Training and Doctrine Command
POD	Port of Debarkation
POE	Port of Embarkation
POL	Petroleum
POM	Program Objectives Memorandum
PWRMS	Prepositioned War Reserve Materiel Stock
SM	System Monitor of the Joint Operation Planning System
SPCC	Ships Parts Control Center, Mechanicsburg, Pennsylvania
ST	Short ton
TFE	Transportation Feasibility Estimator of the Joint Operation Planning System
TPFDD	Time Phased Force Deployment Data
TPTRL	Time phased Transportation Requirements List
UIC	Unit Identification Code
UICP	Uniform Inventory Control Program
USAF	U.S. Air Force
UTC	Unit Type Code

WRMR	War Reserve Materiel Requirements
WRMS	War Reserve Materiel Stock
WWMCCS	Worldwide Military Command and Control System

APPENDIX K

Bibliography

APPENDIX K

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APPENDIX L

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